# Higher Education

## DES to monitor giving of discretionary awards

The Department of Education and Science is to monitur the allocation of discretionary owards by local uthorities. In answer to a parinmentary aucsilun this week, Mrs. Williams, the Secratery of State for Education and Science, sald she way concerned by indications that the pwards for next year would be

Figures for 1975-76 indicate that ohom 27 per cent once was spent on some 50,000 discretionary awards. However, no later figures were avallable. Local unthorities were free to make their own decisions both on the number and the local of discretionary awards. Mrs. level of discretionary awards, Mrs williams said, and she had no information yet about their policies for 1977-78.

arranged for inter this month between officials of the Associotion of Metropolitum Authorities, the Association of County Councils and science, in diseasa ways of monitor-

Mr Brygg Davies, Luhunr MP for Enlield, North, had asked Mrs Williams If she was satisfied that the lavel of discretionary awards being made to students for 1977-78 was consistent with her pulley to give priority to the education of the

to increase tuition fees ended this

wock. Mony have set up joint

student/sraff negotioting bodies in ensure the new lovels do not infec-students to love courses.

somo fee concessions have been made ore York, which has ogrecil not to implement the now levels in special coses; Durhout, which

has given a commitment that no student will be obliged to leave his course; and the Landon School of Economics, which has agreed that the school should set aside £70,000 fur a hardship fund.

Tuition fee occupations end

Most university and polyteclinic fees will not be increased for self-occupations over Government plans financed students mid-course. In increase taking fees ended this

making their owards mandatory, Mrs Williams said she would examine the matter. One reason, she said, why bigal authorities might always make sufficient awards these students was that build ing designs did not include provision for theor. "We have sent a circular osking local amborities to remember this when designing extensions to further education colleges and similar justitutions",

She said.

Mr William van Straubenzee.

Conservative MP for Wakingham, said that anxiety chout the reduction in awards was well founded, or mony of them covered courses which were directly relevant to the cour try's recovery, such as aspects of the medical profession and busines

studies,
Mrs Williams said she could no promise to make oil discretionary awards mondatory, os this would in-crease amblic spending. She-would examine the system, however, and see if there were particular cate gories which the department migh

met Mrs Williams, Secretary fo There was unxiety in many to seek a computation that me standard would be lower thou many would lie lower thou many would wish, he said. The department mitton fees in October.

Palytechnic have also agreed to

this.
The Association of University
Teochers has requested a meeting
with Mrs Williams on the whole



Eyeball to eyeball : Mrs Williams and Mr Derek Robinson, SSRC

## **Applications** for research are slipshod'

Social scientists were chided by Mrs Williams, the Secretory for Education, last week for the "indes-tribably slipshed" way in which same of them applied for public among for research.

She rold members of the Social Science Research Council during a visit to its headquarters that they must do what she did with grant applications in the Department of Education and Science—throw back ill-furnulated proposals even if they camo from academics of they camo from academics of

as if somebody has whistled in the both and then simply reich to pur buth and then simply rrical to pur the notes down on paper ofterwards; and I om bound to say that some of them come from instinations which have most distinguished names and from individuals of very senior negligible. uculemic standing" she

Mrs Williams hinted she would like to see the SSRC become more nvolved la studying the effects of

Two new members have been applied to the council. They ere Sir Jomes Dunnett, former permuncint secretary at the Ministry of Lalianr, and wife of the Grandel Iclerision pruducer, Mr Brian Lapping.

with Mrs Williams on the whole question of tultion fees. The decision to increase them was "one of the most ill-conceived end danteging decisions yet made in higher education by the present Government", a spokeaman said this week.

the films will be used as an endicated visual companent of a third level OU course, Understanding Space and Time, due to be introduced in

student will be obliged to leave his course; and the Landon School of Economics, which has agreed that the school should set aside £70,000 fur a hardship fund.

At City University, the court has agreed that tultion fees fur pertitine attudents chould not be increased over the 1976/77 level, and that, in distributing hardship money, infurity be given to self-financed students oo course.

At Brunel students now have an ogreement in principle there will be no discribilization in foes for new hume and oversees students, but this has to go before council.

Brunel has already agreed that

meximum. At the beginning of the current academic yeer 92 first year students were enrolled instead of the 75 laid down by the council.

Professor Mazzavi, head of loter-netleners.

OU plans link

With California

The Open University is planning to coter into a major scademic collision fornia, involving the production of 16 television progrommes for use in Britain and America.

The dank, which is expected to be formelly agreed in May, has been under discussion by the two university of California is to pay \$100,000 to the Open University content. The CNAA ruting, which is being the BBC for allow more in the content of the BBC for allow more in the content of the BBC for allow more in the content of the BBC for allow more in the content of the BBC for allow more in the content of the BBC for allow more in the content of the being chillenged by the polytechnic, is a cundemnation of the polytechnic. The RSG more to toke pair in the progrommes which will be fillined in British, America, and other ports of the world if necessory. When produced the films will be osed es on endious component of a third level of Course, Uniderstanding and the current academic yeer 25 first year to course and the local enthanting the current academic yeer 25 first year to course and the local enthanting the current academic yeer 25 first year to course and the local enthanting the current academic yeer 25 first year to course and the local enthanting the current academic yeer 25 first year to course and the local enthanting the current academic yeer 25 first year to course and the local enthanting the current academic yeer 25 first year to course and the local enthanting the current academic yeer 25 first year to course under the local enthanting the current academic yeer 25 first year to course and the local enthanting the current academic yeer 25 first year to course under the local enthanting the current academic yeer 25 first year to course under the local enthanting the current academic yeer 25 first year to course and the course and the course and the current academic yeer 25 first year to course the course of the current academic yeer 25 first year to course the course of the current academic yeer 25 first ye

# to continue

polytechnics will continue to de as these sustitutions contents advanced work, occording to fi underpinning this year's Rete

port Grout.

The figures show the take advanced to non-allyanced noise in the polytechnics increasing for 12-to-one to 28-to-one between and 1979-80. Similarly, particularly and day stodents will a crease significantly as a proper of all students in the polytechnology of the source time the important of advanced work in institute. of advanced work in insings of advanced work in insings other than the polytecholes new institutes of higher edges for example—is not projectly increase. The vatio of advanced consulvanced students in these than the consulvanced consulvanc ther education colleges will re roughly the same until 1980.

ments should be increased to polytechnics.

The RSG figures project increase in absolute terms of time day students by 1990, bastelling foll in the important pert-timo work in polytechnics a whole. The ratio of full libration is a statistical to the ratio of the ra

Rote Support Grant, Eighin Per £2 from the local cutharily

The gruop, which is calling on the ment in foll the United Natlans public expenditure sorrey, the soults of which were recently a lished in the annual White Pour The figures ore ceressally a visional, but they ore given so by a recent statement by Williams, Secretary for Education that part-time day student ments should be increased in a polytechnics. berlaration of Human Alghes, moliiulas that universities are refusing to accept children of supporters of the temocratization process, even though these children were only 10 or 11 years old in 1968.

Mujur allegations of pulitical discri-

mination in scienting students for

university lu Czochoslovakia linve

been ando by the "Charter 77"

in o dacoment which has just

cision that higher education is being

icuied, on a mass srale, to the

families of those active in political,

time proof of discrimination and protectionism cited by the group in what it called "Bocupout 4" is unofficial Ministry of Education directive regulating entry procedures in the ecademic year 1976-77.

"Accurally to this directive, no Accurate to this directive, in applicant whose motificulation tesults over clour firsts in oil life casus, white our first in his written entry oxam and ut the same time in his oral, but who did not fulfil the 'class political criterio', is placed lower in the university othery arder than an applicant whose average matriculation result was 2.7 ithut mesus, for example, no firsts and more thirds that seconds), failed the written entry exam and achieved an average grade in his trai, but fulfils the 'close political criteria'."

triteria."

The dacument stetes: "Entry into secondary schnols, and universities, in now determined nor only by the objectiva assessment of the obility, talout and potential of the candidate, and by the correct use, devaloum it is preliquimently used as e reward for political activism and confarcalson, and os a ponishment of parents for their political views, if they are out of step with eurometric political practice.

"These politically motivated dis-"These politically metiveted, dla-

HARRES DHSS change mind

Trace and a service of the particle o

streets of occupied Frague alne years ago.

criminatory sanctions thos affect the most sensitive of human relations, ite, the ralations between purents and children. They intimidate purents and children, end damand superficial conformity and hypotrisy.

"This discrimination, efficiently implemented, though never publicly acknowledged by the Government, is in direct contradiction to the practionations that the socialist saciety respects ability in all its eldrens and gives them all the means of fully developing and using them.

"Instead of telented epplicants, the schools and universities today accept below-average students who are, it whose parants are, politically active, and conformist, either sincerely or hypocritically, and who ore willing to accept and support evarything that the present Government proclaims."

ment prochains."

The signatories of "Charter 77"
Document 4, rishin that the solechiou procedures have a demaratleing effect on the "morel profile"
of the ynoug and an the teachers,
who are forced late a moral
diletume because refessi to imple-

criminatory sanctions thus affect the ment the directives would threaten

THE TIMES

Czechs use university entry

as 'reward for conformity'

Higher Education
March 25, 1977. No. 283 SUPPLEMENT Price 18p

#### **OU** in talks on transfer scheme

The lauroduction of a credit trousfer scheme, allowing the move-atum of students between the Open University and traditional university courses, is to be exomined at a key aborting tudy between the Committee of Vice-Chancellors and Principals and Open University

representatives.
The meeting will be the first of scries of regulor llaison sessions however the CVCP and the Open University. It fullows similar negminations between the Council for National Academic Awards and the Council for Mational Academic Awards and the Council for Mational Academic Awards.

Kent, Salfard and Sussex — already have agreements allowing Open University students with three, ur-in the case of Kent two, relevant rrealis of transfer to the second reality of transfer to the second year of a depure course.

Today's talks, although prefluitnicy, are to be nitembed by Sir John Haldsakok, CVCP chairman and vice-choncellar of Oxford University, and Sir Walter Perry, vice-chancellor of the Open University. The talks could lead to un expansion of really transfer agreements on a national basis.

A CVCP spokesman said this week that other Isaues, Including scademic callaboration and research possibilities, would be discussed.

The document is based upon an appeal made to the Federal Assembly of the Czechuslovak Socialist Republic by Professor Venek Silhan, an economist who was acting deputy to Alexander Dubrok doring the Russian invasion of Czechuslovakia, it was made last November, for has also only just reached the West through the Palach Press Agency.

Both documents puint out their discrimination in education contravonas the United Nations, Ducloration of Lechuslovekia signed in 1968. The Declaration was reconstrued in the

# SSRC grants

Nearly (500,000 worth of current

Czechoslovokła signed in 1968. The Dechration was reconstituted in the concluding out of the European Security and Cooperation Conference held in Helsinki in August, 1975, and became part of Czechoslovok law on March 23, 1976.

Professor Jon Patocka and Professor Jiri Hujek who drew up Jurimment A demand the revocation of mont 4 denand the revocation of all existing discriminatory Ministry of Education thractives,
Extracts from Professor Silhan's letter will be published in The THES next week.

Lord Vuizey put o series of ques-tions about SSRC offulia in recent weeks, osking shout the qualifica-tions of its officials, its administro-

## Contents

Oxford's condition



report Peter Wilby looks at Oxford today, its academic standards and capacity for innovation, its admissions system, and its tangled finances, 6-9

Profiles of Balliol, St. Peter's, St. Edmund Hall, Nuffield, Christ Church

#### The end of growth

Richard Hoggart reflects on the changed atmosphere in universities and colleges after five years at UNESCO, 15

#### Students today

Charles Clarke, president of the NUS, replies to Ralf Dahrendorf in "Talking Point", 11

Leader, 14

#### Chemistry's century

Oo the other hand	ej 4:.
North American news	
Overseas news	
Letters	, 14,
Noticeboard:	
Books	17-
Classified index	

ardinated anti-semitic campaign is being waged in universities and

Mr Simon Caplan, chairman uf the Union of Jewish Sindents, claimed this week that two lilentical motions had been put before at least 17 student unions this term. "We feel this campaign is being organized centrolly by anti-Ziuniat organizations and that it represents an increased threat to Jewish students" he said.

Lancostar university unions have all passed motious expelling Jewish

"There is a fine line between what is anti-Zionist and what is anti-Zionist and what is anti-sentific. Some of what has happened has bordered on the anti-sentific. At Salford, for instance, jewish students have been prevented from using the union facilines."

Last week the University of Manchoster Institute of Science and Technology Jewish Society served a High Court writ on the UMIST students' union to prevent them from debating o motion that "Zion-

by Judith Judd

India's constitution. It is possible, however, that when students return next term, attempts will be made to

nicer the constitution.

Mr Stuart Benson, chairman of the institute's Jewish Society, said the motino would almost certainly have gone through because of the high number of Arah students at UMIST.

Attended the Middle Foot issue

has been raised in student unions throughout the country, the "unti-

has no official policy on the issue, and an anti-Zionist motion tobled by York and Sulford for next week's by York and Salford for next week's conference has not been given any priority. Mr Trevor Phillips, on executive onember, said: "We leed that there should be more debute at lacul level before the minim discusses this authurally."

Mr John Oven president of the priority of the minim discusses the same of the priority of the minim discusses the same of the priority of the minimal services. The priority of the pri

Mr John Owen, prasident of Sal-furd University students' union, de-nied that the Jewioh Society had licen expelled from the union. "It is not true that they cannot use the union facilities. They simply

thought it was true.
"I think they are suffering from a persecution complex."
Student noion afficials at York,

Lancaster and Warwick also denied that university Jewish societies had been expelled from membership of their student unions. A Laccuster spokesman emphysized that the The writ claimod that the wording of the motion contravened the exist on campus.

## Big increase in number of students in 10 years

Mr Frank Hooley, Lnbour MP for Sheffield, Heeley, asked Mrs Williams, Secretary of State for Education, In the Commons to state the total number of full-lime students in universities and colleges of education in the acudemic years 1966-67 and 1975-76.

In the acudemic years 1966-67 for the polyteclinics in the acudemic years 1966-67 for the polyteclinics in the polyteclinics in 1970-71 and 1975-76.

He also asked how many full-time and port-time students there were in

Science

Mr Gordun Oakes, Minister of State oversecoling higher education, issued the full mining table cuvering full-time and sundwich course students except where part-time students are specified. Universities (United Kingdom): 268p 189 Polytechnics (England & Wales) : 1970/71 1975/7G 1976/77 It.a. Formar collegee of education [England and Walos] : Initial teacher training courses Other colleges of further education (England and Wales): Full-time and sandwich courses

## THOMSON SMALL & FRIENDLY LOW, LOW GUARANTEED PRICES FROM £49

Holidays subject to availability. Only Government action can affect those proces.



## 'Lone wolf' **Cecil Hoare** honoured

hy Clive Cookson

The 85th birthdoy of Dr Cecil Hoare, described as "the most eminent protugonlogist of his time", has been marked by the publication of a Festschrift in his humaur.

A new species of protozoou has been manted after him, too. It is Trypmasonna recili, a porasite discovered in Sunth American caymants (allignturs) by Hr R. Loinson, of the Instituto Evandro Chagas in Brazil.

Dr Humae's life work has been

the classification and study of parasitic protozna, particularly the crypa-masumes that chase sleeping sick-ness in man and wasting dis-cuses in animals. It forms the basis of a search for a raccine for Chagas' Disease (Smith American sleeping stckness) which is now being undertuken at the Wellconte

Research Laboraturies, He has been actively associated with the Wellrume organization for 5.1 years, and is still working in the Wellcotto Museum of Medical Science in London.

Science in London.
In the upening paper of the Festschrift, Dr A. J. Duggon, director of the Wellcume Museum, writes: "It is difficult to believe that Cecil Hoare retired from this official past with the Wellcome thranization in 1957, because he innuediately theroufter devoted a decode of this blo to his moster work, The Tryponosomes of Manuals, which was finally published ofter ito had attained the ago of 80".

Dr Hoare was born in Holland and educated in Russia. His sendemic career began in the zon-ingy deportment of the Imporial University of St Petersburg, but it was interrupted by the Revolution, which he spent in captivity until the British Government undertook life ropatriation in 1920.

"It is unlikely", Dr Duggon writes, "that such a long euccession of fruitful discoveries as those made by Cecil Hoore will ever be repeated

or truiting discoveries as mose snace by Cecil Hoore will ever be repeated during the lifetime of a solitary in-vestigator. He is one of the few 'lona wolves' remaining in

Festschrift in Honour of Cecil Hoare, FRS, can be obtained from the London School of Hygiene and Tropical Medicine, Keppel Sureet, London WC1. Price £S.

London University Institute of Education is lo mount a new post-graduate degree course concentrating on the rights of parents, teachers and students in education. Work for it will be condinoted by a centre for rights in education, the aim of which is to bring together teachers and researchers interested in this field.

teachers and researchers interested in this field.

The degree will have a core of law, philosophy and history together with three options; the rights of disadvantaged groups, the rights of women, and the conflict of rights between parents, the state, teachers and students.

The centre for rights in education is one of several interdiscipalinary centres being i established in the institute. A centre for political education is was established in the institute. A centre for political education is was established last September.

The laterhalive was grawing grawing grawing education is was established last September.

The laterhalive was grawing grawing grawing education is was established last September.

The laterhalive was grawing grawing grawing education is was established last sinding. The laterhalive was grawing education is was established last sinding. The laterhalive was grawing education is was established last with laterhalive was grawing spenje. If Clarke said.

Your Unemployment. NIS Memoria itiques and is available to said was a constant to a strend to strend to attend to atten

the well-the fire for the first bearing to the state of t and the property of the proper

## Polytechnic staff oppose Teesside merger plan

Staff at Teesside Pulyterlanic are opposing a merger scheme with Teesside Cullege of Education on the grounds that it would give the reflect for much importance. The scheme, devised by representatives and.

Staff were also now a from the college, the polyterhole and the local authority, would divide the resulting institution into three sections one of them the

college.

But, although it supports the inerger in principle, the pulytechnic and a local substy of the local authory of the local authory of the local authory of the local authority of the tworking party's report. It wants the college to become a sixth faculty of the polytechnic.

The authority has no per faculty of the polytechnic.

The authority has no per faculty of the polytechnic.

Dr Alan tlswald, branch chair-Dr Alan tlswald, branch chair man of the Association of Polytechnic Teachers, which has also appased the report, said there was romern unung staff that the three divisions would be of dispreportionate size, porticularly if teacher to develop and designed that the firther training numbers had to be further reduced.

Staff were also may be lack of consultation before righirt was diawoup. The working party two

take, and there are a consultations.

## Graduates should take jobs technicians DES chief says

Graduates should be regarded as a source of technicians as well as specialization throughout reclinologists. Mr Junes Hamilton, and higher education throughout reclinologists, Mr Junes Hamilton, and higher education throughout the permanent Secretary at the Hepartment of Education and Science, the power situation the function and a careers convention this week.

Mr Hattilian, who was opening the Thomes Valler Engineering Carrers Convention at Reading Uttiversity, said there was nothing wrong with fittling employment at technician level after getting a degree.

Mr Hattilian, who was opening the fittle was nothing attributed in the field, it shall, they should produce a graduates.

Mr Hattilian, who was opening the fittle was nothing attributed and produce a graduates.

Mr Hattilian, who was opening the fittle was nothing attributed and graduates.

infully by the Department of Industry, the Council of Englocering Institutions (CEI), Berkshire Careers Service, Reading University, and the Invertment-backed PETT Committee. It hegan with a symposium attended by 150 representatives of local educational and engineering cancerns, many of wham stayed on

crisis threat

diestrialists -- "It's extraore"

The Clif is attempting mi-

racely that hannens"

Liverpoul University is to close its dapartment of Celtic studies at the end of September because it is falling to attract a sufficiently high standard of students. ventions made a greater is

The decision, which was made in March, 1975, was reaffirmed last month alter nu eleventh-hour oppeal

Mr H. H. Burchnall, the registrar, said: "We felt students of an appropriate quolity were not forthcoming, and Celtic was taught very well at a number of universities—out least the University of Woles."

graduate courses in Celtic should not have sufficient depth; thut there were iosufficient members of staff to teach it; thou the library

Celtic culture—but students at Liverpool can no longer choose it.

Liverpool to end Celtic studies 'on entirely

academic grounds' despite growing interest

Nationally, applications for Celic were rising; interest was also growling internationally. The decision
lad been token not the grounds of
the quality of the first few entries
after the degree course had started,
he said. Not many students knew
about it, although the department
had offered Celtic studies in some
form since 1908.

This committee recommended that the department he phosed out, a decision rejected by the onspority of the full board of the arts faculty, then ograed by the senare's academic planning committee.

A foctor that may have adversely influenced that decision according

appropriate quoting were not forthcoming, and Celtic was taught vory
well at a number of universities—
oot least the University of Woles."
Grounds for the decision ware
entirely academic and not financial,
he added.

Dr N. J. Williams, head of Celtic
studies, said the decision was
against his better judgment. "I
am disturbed that the only English

did not have sufficient resources oud that it would probably out double the intake uver 10 years.

# A foctor that may have adversely influenced the decision, according to Dr Williams, was that the department had no immediate representation there and was therefore

Ist a strongly-worded defence of universities' contribution to industry, sent to the Prime Minister last week, Mr Laurie Sapper, general secretary of tha AUT, says that the work of universities often goes unmentioned in public spoeches. "It is not widely known that milversities make a substantial contribution to the industrial field dirough their rasearch and education."

During 1975-76, he says, more

department, hickupier, this writing of rechanges of processor with the commerce of the processor with the p

University law courses 'need new approach'

university law courses was voiced at a conference on the role of the lawyer in public service, organized by the Institute of Judicial Adminis-tration in Birmingham last week.

The brum of the armek was that law degrees were geared largely to hav degrees were geared largely to the student wanting to become a practising burrister or solicitor. Those who might want to become largers in central or heal govern-ment, or in the administration of justico were builty served by the courses ovailable.

The conference was told that in practice only 60 per cent of law graduates antared the professions, yet the requirements laid down by the legal professional bodies dominated the content of nost low

Professor Putrick McAusian, of the University of Warwick, said that English law schools lond falled lamentably to educate inwyers to perform legal advice functions and to understand the policy aspects of

There should be much more policy-oriented teaching, he went oo. Instead of students learning merely what the law suid, and whot was on the statute books, more should he tought on the lunction of the low in solving sociotal problems, and on

new approach to legal education, and more integrated inter-professional courses, which would

To help the potential lawyer in public service, he called for mure joint appointments, where people holding public legal office would he lecturers at the same time. There should also be more willingness by hadi law schools and the public legal service to allow reciprocal secondinents and leaves of absence.

Professor McAusian urged the setting up of a school in teach legislative drafting. "No single development is more important and mora overdue", he said.

Delegotes at the conference were Delegates at the conference were in hrund ogreement with Prolessur McAustan's general views, but questioned whether the conditions obout the content of law courses inposed by the solicitors' and hardsters' prolessional hodies were as restrictive as had been claimed.

In was judated out that in on indergraduate law degree syllabus of same 15 ur even 18 courses there were only six "core" subjects on which the professions losisted.

Mr Gurdon Borrie, Director Geo-eral of Fair Trading, previously Dean of Birndingham University's low laculty, argued that even withlo thuse "cure" subjects a grest deal It was not just a questing of providing one or two courses so legal policy, Prufessor McAuslan said, Whot was needed was an entirely policy elements.

## Mrs Williams asks CVCP for ideas on saving money

The Government is not committed to raising tuition fees for 1978-79, Mrs Williams, Secretary of State for Education and Science, hos told vice-choncellors.

One of the committed of the committed outside the committed of the committed outside the committed outside

But it is committed to making some savings from further and bigher education, and those generated by the 1977-78 levels are unlikely to be sufficient.

In a letter last treek to SIr Jobn Habokkuk, cheirman of the .Com-mittee of Vice-Chaocellors and Princhals, Mra Williams asked for

Princlinals, Mra Williams asked for suggestions on ahernotive waye of making the suvings.

"The size of the gan, and the woy in which it will be filled, or an unsettled questions. Your advice that I ohould not look to fees is piein and I have noted it, ele said.

"But I should also welcome the opportunity of discussing the whole issue with you and your colleagues and to have your views on whore else I should look for the savings that have to be found. They will, I am afraid, heve the come from higher education and advanced further education. She emphasized that it was not possible to revise the new lee lavels for 1977-78 because both the Rate Support Grant and the universites'.

The CVCP was totally opposed to high lees, the stotemant said. It stood by its cose made in June last year that university fee iccome should not exceed 10 per ceot of the total.

"We have on several subsequent occasions made strong representations to the secretary of otata. To the great regrat of the committee our views have not prevailed. We think the Government bas made a great mistake."

The figure mentioned by Mr Fowler, then Minister of State overseeing higher education, as the eum to be roised by feas in 1978/79 was f14m on top of the £28m resied by the National Union of Students-in

Support Grant and the universities' recurrent groot for that year assumed that the new levels would

Mis. Williams has agreed to meet the National Union of Students in a month'e tinto to discues fea levale for 1978-79.

Statistics. Computing Operational Research

# FAR FROM THE MADDING CROWD

n.a. = not avoilable; p=provisional

For those, who like their holiday to have a little individuelly Thom-con Holidays have introduced their Small & Friendly programme for this Summer.

Fly from Luton or Galwick to one of 41 rescrite in 17 holidey areas.

You will stay in email, often lamily-tun hotels or pensions, usually with private balbrooms.

Priose are guaranteed free from surcharges and range from 249 for 7 nights on the Costs Brave to \$189 for 21 nights in Greace. The costs gray pay is the 2 per cant Government layy. See your travel egent for the Thomson Small & Friendly brochure or phone us on 01-367 4461.

#### THOMSON SMALL & FRIENDLY

# rounnativations by MEC-regional panels of engineeriet, valued and help with article. The contention clearman, Mr Peter Clee, expressed illsappoint ment that only 1,58t youngstrs attended the exhibition not of 30,000 in the Thannes Valley orea. One school claimed that it a sixth form of 160 only one pupil was interested in an engineering career. Professor Peter Dunt, of Reading their sixth Engineering Repartment, purpose very well.

#### Student jobs Occupation to go on

Student unemplayment is reaching in nucleoched, threaten the fallic of democratic society. Mc Charles of democratic society. Mc Charles of democratic society. Mc Charles of the National Union of Students, warned last week.

Lannching a new NUS repure on youth unemplayment, Mr Clarke spoke of the dangers of political diseichantment among students who left collego without a jab. He called for a twa-year guarantee of entphyment for students and the chnice of a jab ur further training for lib-year-uld school leavers.

In the report the NIIS ce.

Students at Narth Suffer Science Correspondent

Polytechnic lam week in Science Correspondent

The grawing prestige of blophysics cuntinue their there is illustrated by this year's Royal is illustrated by this year's Royal halls on the college's Sociaty elections. Three of the new Stude sitrs in potent of Sociaty elections. Three of the new become subject, and the students have chemistry galns oix FRSs, and eoglophysics of a jab ur further training for lib-year-uld school leavers.

In the report the NIIS ce.

In the report the NIIS ce.

grating all Government for intelessness programmes.

Whatever the Government did,
pulsion,
Better careers guidance in

# **Fellows of Royal Society**

Tropical Medicine, Keppel Street, London WC1. Price fS.

Centre for rights

In character framework and students in education. Its rights of parents, leachers and students in education, the leaves are sured at the new fellows are Sussible for the new fellows are the new fellows are university to t

Dr Isabella Mulr, head of the lochemistry division at the Kennedy Institute of Rheumotology in London, is the only woman in the

Eight scientists working overseas Elght scientless working overseas are included (lour from the United States, two from Austrelia, and one sach, from India and Canada), thousand elght are estached to non-university institutions, including thise in industrial research to Dr. Research Laboratories in Essex; Dr. William Streng, technical director of EAC's Cummercial Aircroft Division

# In Bristni; and Dr Alfred Spinks research and development director



## Biophysics experts among new | How industry is helped

Industry and commerce earn at least £100m a year by exploiting inventions by university stoff, according to the Association of University Teachers.

their rasearch and education."

During 1975-76, he says, more than 500 inventions by university istaff were patented involging the National Research Development Corporation, which is concerned with research devolopments with potential for industry or commerce. Among the top 10 major licence revenue samers, five hove come from the universities.

Industry, and commerce, in the private octor pay lor their apprentices skilled and semi-skilled.

there would be further increases in that year, he said.

"This would be deplorable.
There should be no insunderstand-ing about the strength of feeling against high fees, and the com-mittee wishes to leave no one in doubt that if the feea lor 1978-79

were to represent a oubstactal in-crease in the present level there would be mossive discoutent to the universities." The CYCP was totally opposed to high lees, the stotement said. It stood by its cose made in June last year that university fee iocome should not exceed 10 per cent of

assumed that the new levels would a month's tinto to discuss fea levale apply.

"Your decision therefore to concentrate on measures to discuss fea levale for 1978-79.

"Are Pote Ashby, deputy president of 1978-79.

"Are Rull's individual of 1978-79.

"He said that tha union also hoped the said that that union also hoped the said that th

# FREE PREVIEW OF A V PROGRAMMES ON

First a descriptive brochese and repty-used previous form sand this coupon to parametration exquerious tro., i. 43 Criticipa ond Braddway. London NW2 JET. 01-456 6275

Picase and ine your biochure and repli-puld preview form, NAME (PRINT)

AUDRESS

Arts graduates from Holl University last year did not realize that they could make a contribution to udustry, the annual report of the Careers and Appointments Service

Only four one of the 268 arts graduates entered manufacturing. The report says: "Arts graduates simply fail to appreciate that their intelligence, analytical ability and powers of communication ere just as important, perhaps more so, as a deep knowledge of a particular 'relevant' degree subject".

Based on the crude massure of A levels, the arts students had the highest level of "bodin power" of A levels, the arts students of highest level of "brain power" of any group of Hull students. British indostry's problems would be overcone only by using the best brains. "Certainly a cover in industry is not appropriate for every graduate, but we are disappointed that so few of our atost able graduates give so little thought to the possibilities," the report says.

The report varies "Further expansion of cocation courses in law could be a recipie for disaster unless the cast majority of LiB stolents can be persuaded to look for careers autside law, and there is little evidence that they wish to do sn."

ing places, 34 per cont of all aris graduates went into tearher training. Mony see teaching as the only field of work they can consider seriously, and the percentage exterlug teaching was 2 per cent higher than the

Although there was still a shortage of teachers of arts subjects, notably English and languages, there could be no doubt that same of those completing training in 1977 woold be mable to get jobs.

accepted by CVCP

tives of the Association of Univer-sity Tenchers and other unions con-

cerned with university safety.

It will advice no matters cunnected with safety, and report to the CVCP.

The AUT and the National Union Students have been favited to

name representatives, and the trade bulou side of the Universities' Cum-

mittee for Non-Teaching Staffs is to supply 10 annineca from all other unions lavelved. The All' representatives will be Dr Cecil Wells, of Birmingham University, and Mr John Akker, donnty

John Akker, deputy general sucreary.
The committee's first task will be

Joint approach on safety is

The Committee of Vice Chancellors and Principals has ngreed to set op a finit consultative committee on safety which will include representationally which will include representations.

to look at regulations on the question of safety representatives and select committees coming into effect in October, 1978. In particular it

GO AS YOU PLEASE ON A

THOMSON WANDERER HOLIDAY

GUARANTEED PRICES FROM £39

Spain and the lawley of more than a dozen ploces from Spain and Ity lelands to Austria and Swijzerland, We give you vouchers for hostel or pension accommodellon and leave

you total freedom to room as you will or stey rooted to the

Prices are unbelievably low, from ea little ee 239 pp for 7 nighte on the Coela Brave to £126 pp for 28 nights in Crete (from Lulon) and £121 pp for 14 nights in Switzerlend (breakfaet included in prides for Austria and Switzerland). The only eddillone coot you pay is the 2 per cent

See your local trevel agant for the Thomson Wanderers

Generally, fewer graduates—5 per cent compared with 6 per cent the year higher—were memphased at

Among scientists, the mathematicians, chemists, physicists and electronic engineers had relatively few problems in finding jubs. A smaller proportion of graduates in these subjects, 19 per cent compared with 22 per cent the previous year, entered presignadoate training courses. Finding Jobs was less easy for hislogists and geologists.

Mnny economists had to make compromises, the report says, although must eventually found jobs. Posts in oconomics research were virtually unobminable, but many were airracted into lanking

that they wish to alo sn."

The report highlights the diffi-culties of certain groups of sundents

---the handicapped, coloured immigrant, and thature graduates—in finding jobs. It attacks rigid recroirment policies that exclude abler graduates, and urges companies to examine ways in which matore students could be assim-

The Civil Service, it suggests might take a lend by dropping it upper age limit of 28 for applicant for exerutive officer nosts."

University.
Mr Akker said the AUT had been

pressing for representation on the

rently planning a series of specialized linudbonks on such topics as ized handbonks on such topies ized handbonks on such topies fire precautions, lasers, university workshops and laboraturies as part workshops and he general principle.



The sixteenth-century Persian anininture, abuve, shawing ladian war elephants being routed by cavolry during a battle between Alexander the Great and Porus, is mue of the 10,000 Persian minatures owned by the British Library. They form the basis of a new exhibition in the library's galleries at the British Museum, open until July 31, weekdays 10 in 5, Sundays 2.30 to 6.

An exhibition of lunks in Mancho, the language of the numadic tribes who destroyed the Ming dynasty of China in 1644 and inaugurated the Ching dynasty (1644-1911), is also on show at

## Falling population 'could put polytechnics at risk'

Mrs Margaret Rees, chalrman of the liner London Education Autho-rity's further and higher education olicomminer, said that outers the polytechnics could find new kinds of student end convince the Govorn-ment they were doing something onique, they were guing to be ut considerable risk when the 18 plus vice chancellar's safety committee for a year. "I regard this as a population storted falling in the

sucress. There is a very great area for scape remeal coordination of training and advice on things which are of abunal concern to the trade Huless higher education institutions attract a higher proportion of the 18-plus age group there will be unions and the universities."

Intil now, the CVCF has resisted isrge numbers of spore places --especially in the polytechnics which, a juint central committee on the grounds that it would impinge on the autonomy of individual onirersities, he said.

The CVCP working group is curwith mie m two honouruble excep-

tions, have become a pole model of the universities."

She added that anno polytechnics were getting rid of sub-degres work as fast as they could and so excluding the groups of potential students.

The polytechnics will be in jeu-pardy in an era of falling pupulas than unless they make a greater effort in establish themselves as different from the universities, a senior local authority educationist warned at the weekend.

Mrs Margaret Rees, chalrman of the luner-London Education Authority leen hiteactly critical of the luner-London Education Authority for the luner and higher education Speaking at a meeting of the Lon-

don. Students' ttrgomzation, Mis-Rees produced figures should that while the number of 18 year olds in London would vise slightly between 1977 and 1981, they would fall by 40 per cent by 1990. At the same time population movements out of the dismirant would leave a rule of the dismirantaged in the innectify. Public sector further and higher alucation had a responsibility for this group, she said.

Ourstloued by students, Mrs Rees defended H.EA judy von auturnsing a quata for opercess students at Landon colleges, arguing that resources had to be redistributed to those in need in areas such as Brixton.

## Ulster college intake cut

### Tory 'task force' move

Britain, comperes with 1,373 least year and more than 1,300 in 1974.

Lord Melchett told e meeting of the edvisory committee that priority had been given to the creation of employment over the past two years and that intake to the colleges nuar now ha matriced with wastaga from the profession.

Ha admitted that there was uncertainty about wastage rates, but had public announceament of the new intake levelo.

Hnwever, e paper prepayed by the Department gave the current wastage rates are removed. Hnwever, e paper prepayed by the Department gave the current wastage rates are removed to give the current wastage rates are removed to give the current wastage rates are removed. Hnwever, e paper prepayed by the Department gave the current wastage rates are removed to give the current wastage rates for which, published of any professor builds. Hadder, principles of committee to possibilities for their rudges of the engineering and polytection and full working from membership of the engineering are removed to give datails until after bring production at Birmingian University in the five most removed to give datails until after bring production at Birmingian University in the five bring from the five most removed to give and in the five most removed to give datails until after professor of chaptering of professor of chaptering are removed to give the current wastage rates for the captering removed to give the current wastage rates for the captering of the condition of the professor of chaptering to the condition of the profes

#### Experts who Um the other hama know more about less

Professor Arnold Kenle policy of literature of the Open United International Professional Inches Strongly relations adments administration of the policy administration of the policy administration of the policy administration of the policy administration of the Open United Structures and the Open United Structures administration of the Open United Structures and the Ope lization in higher education much sirable and sulf-defeating

out less and less,"

subject into something delibert mystifying to those who do share its secrets and I see and our and deep dangers in this",

However, this year it was different. On a bank of complete in-difference I round and whooped and cheered. When they came into viow, I threw my scorf into the air; trat because of over-specialiti. Particular subjects were not a when they crossed the line, I hugged with in relation to the ring situation in the world.

The exclusiveness of many in load, only to be overhauled and subject disciplines was imprint.

Afterwards I surged forward to congratulate them and one that I too had once rowed, because of least it was a aport one could do sliting down.

Afterwards there was another raca involving crewa from the sams uni-vorsities. I looked the other way pointedly sud whistled.

lead the next specialist education in the cause there failed to achieve that a law burours degree weter specialists in their subject.

Mr. Jim Parter, principal of standard in the line of the "barrening of the country lead of the country lead of the "hartening in had received the what they to universe will be suffering l'NAA-validated bight by September, the unajority of the law the DipHE had been intoded by september. Challenging the internal the DipHE had been intoded to countrie the interliging role of the countries the interliging role of the countries the interliging role of the countries the interliging role of the countries. Challenging the internal the DipHE had been intoded to countries the interliging role of the others fored noy better. Of course, if you did not know graining inclinaries would be watching was a drama about an old man in a sonce driven mad by seven occentric women who all talk at done centred no independent set increasing and pointing of him one centred no independent set increasing and pointing of him one centred me independent set increasing and pointing of him one centred me independent set one, computing, art, economic.

Britain was still very used to the laughter. Admittedly, and we would be a small and accing and pointing of him which would put a strain on any friances. Britain was still very used to the laughter.

nusics. Social actionees and To my anazement the audionce nusics.

Hritain was still very tied to roared with laughter. Admittedly, many of them were school perties, course but there was a good of led by classics masters who got all the some subject areas, nearly up the jokes and just about wept at all

meichett, intouds to cut their intake to 700 next September.

The unew was given to the Advisory Committee on the Supply oud Troining of Teachars, which hed is as a result of the truit of The figure of Tooling of Teachars, which hed is granged in reasrach, not find efficient, comperes with 1,373 larged in the patty in the finded College, or to college in the figure of the children and their interval and the chair interval and their interval and t However, back at the plot, the seven eccentric women were salli datcing o lot end making life pretty intolerable for the nice old man in a her who had by now got some of his friends in to sort out these dameo. The idenouement, was quite unexpected: one of the girls auddenly hung a large drawing of a knicken on the well at which one of the nice old man's, friendo set fire to the building, e view with which we must have sympathy.

As I looked round the audience.

As I looked round the sudience, inoticed that most of them were rending a book. Well, I did not think the show was as bad as all that,

topics recently, it is because he is currently on the high sens with Lauren Bacull, Mel Tormé, Joe Loss and Lody Isobel Barnett whose tolents have been lived by Conard immediately apparent purpose). Thirdly, the "intellectual brain" to entertain passengers on an \$1-day applies scientific laws (train a select band of selliess bats to sleep clustered round the hell's clapper

Romance is dead—official. Time was when young near, crossed in lave, went on expeditions to lorger and came back purged with armfuls of plant bugs and nontadic pursus;

In July the Royal Geographical Society expedition to Mulu (Sara-wak) sets off for 15 morphs and the Cumming, takes n strictly scientific line, "The accumulated experience ls no more certain aquatic route to oblivion. of a century and a half ensures that expeditions have e practical parpuse and that they are able to concentrate on the acientific ends for which they are plauned."

Forty-two scientista are to spend months ut a time thera to prudure a survey uf the Geneng Mulu rain forest which is endangered by

At the launching session the team members also took a practical line. As they sat in the oaken hall of the Royal Geographical Society with the nones of great Victorian explorers inscribed around the wall, they outlined the scology of the district out the importance of processing rain forests. tecting rain forests.

The only dash of old-style romance was the oxpedition leader, Robin Honbury-Tsnisoo, an explorer who looks like Captain Mark Phillips and sounds lika David Attenborough. He showed us alides and talked about "base camp " and "hoving to cope with moments of drama".

His eyea lit up when amid all this scientific talk, a colonial gentleman got up and aaked him to give his regards to a very old friend in the Gunong Mulu National Park district. Probably someone he met while over there forgetting. "Isek has invested his gloves

#### Flash of genius

Evor sincs I invented a device for making church bells ring allently in the eorly hours of the morning. I have been faccinated by the whole process of invention. Its precise notice becomes cleerer this work with the publication of precise noture becomes cleerer this week with the publication of How To Invent, by M. W. Thring and E. R. Laithweite (Macmillan,

The authors, who are professors of mechanical and electrical engineering respectively at London University, say that 50 per cant of normally intelligent psopla could be inventors if only they freed thair minds from received educational shackles and exercised

Their analysis of the "Inventive flash " io remarkobly eccurste in my own case. First, the "amotional broin sees a human problem and dealreo to solva it (church bolls are a public menace and a melor



### Problem of post-school age group

such that, come encharist, they would cushion its blow and aid

iliose who believe that worship la not possible without eight hours

To coincide with the book and the British Genius Exhibition planned for Natiersea Park next

Bookmaker (5)

sity novel are almost complete. The

and who holds the Brillo Pads pro-fessorship of mixed ability

To establial his absentmindedness you can have a breokfast conversa-

"Where are your gloves, Jack?"

is a natural for this.



vacuum euilnently tolerolile. The goping tiole left in the Guvernment's legislative programmo by the suspension of the devolution debate provides MPs with corlier nights and

For those like myself who entered he House after the first election of 1974, this month marks the conclusity novel are almost complete. The only mojor character left is the absent-minded academic who in my novel will be called Jack Maybee and who holds the Brille Pads prosrnment will also selze the opportu-nity in take stock of the situation in which it enters upon the second half of its parlismentary term as o minority administration. Against this sombre background it may prove useful to examine the Govornment's record in that area of sducation to which it has allocated priority namely to postschool

Not being of the school that believes that this perticular Government should hide its light under a
buokal, I begin by testifying to the
advances which have been made.
The quality of any educations
system depends cruciolly on the
state and ability of the teachers.
The Houghton eward brought a
highly significant improvement in
the saleries of further oducation
teschers. with the Midland Bauk. . . . Yas, wo'ro all aurprised, Margot. . . . No, they're not valuable. They are woolly, with three fingers missing oud daisies sewn arross ths In thio way you can gradually have him distractedly invest his

entire wardrobe sud s neighbour'a The greotest single new otimulus to the work of the colleges has olearly boso the developing rols of the Troining Services Agency. For many colleges the rosult has wataring can ontil hia absentmindednosa haa been impressed upon the roader. You can then go Recsully there were a spata of essess in Oxford where kind-hearted dons were "connod" out of lorge aums of money by confidence tricksters, working in gaugs, who claimed they had once met on hollday and had now follen on hard timas. Jack had now follen on hard timas. Jack do not detract from the impressive achievament of this programme.

One night he answers the doorball to find Don Connors and his 38 student numbers with the tendancy

to find Don Connors and his 38 brothers crushed into the porch.

"Hello", says Don, "Remember us? Isle of Wight ferry 1932?" A half smile of uncertain recognition playa across the kindly Egyptologist's feee.

"If I were to say "Shanklin say scotto where your wife swallowed two small rubber weshers", would that help?".

Teach with this wealth of circum.

Faced with this wealth of circum experience than their counterparts than in the achool.

stantiol deteil, Jack turns and shouts in the achool.

Moregreer, the student body itself reflects a heterogenalty which broedens perspectives with its mix of part-time and full-time, young and mature students. Although the once worked in industry." He grows confidential, "She worked for a firm that made ismon sponga puddings and it has affected her priorities."

Eventually they can hint out of four Persian carnets and a package

Eventually they can hint out of four Persian carnets and a package

Eventually they can hint out of four Persian carnets and a package

Execution of council ond the Business Buccation Council give, some hopes of greater rationalization.

In adult education, however, the student body itself reflects a heterogenalty which broedens perspectives with its mix of part-time and full-time, young and mature students. Although the sudents of part-time and full-time, young and mature students. Although the sudents of part-time and full-time, young and mature students. Although the sudents of part-time and full-time, young and mature students. Although the sudents of part-time and full-time, young and mature students. Although the sudents of part-time and full-time, young and mature students. Although the sudents of part-time and full-time, young and mature students. Although the sudents of part-time and full-time, young and mature students. Although the sudents of part-time and full-time, young and mature students. Although the sudents of part-time and full-time, young and mature students. Although the sudents of part-time and full-time, young and mature students. Although the sudents of part-time and full-time, young and mature students. Although the sudents of part-time and full-time, young and mature students. Although the sudents of part-time and full-time, young and mature students. Although the sudents of part-time and full-time, young and mature students. Although the sudents of part-time and full-time, young and mature students. Although the sudents of part-time and full-time, young and m

recial pump printing to enable local initiative to ligarish in a critical area of social disadvantage. The resources controlled by control government have been exiguous but enthusiastic coluntary commitment, and the power of television broad-casts have contributed mightily to a highly encouraging venture. This record, however, scarcely represents a coherent pality for responding to priority needs of the 16 to 19 age group, nor an impressive advance along the road to education permanne. Counterbalancing the modelphoid suggester can be

deed it represents a most praise worthy example of intelligent minis

ing the undoobted successes can be set a melancholy list of procrastination, neglect and in several crucial respects of contradiction of estab listicd priorities.

The expansion of awards in recent years may be thrown into sharp reverse, with severe consequences for many sub-degree courses. One illustration may soffice. The Government has insdemuch of its determination to axtend courses in trade union atudios in the wake of recent legislation which greatly increases the responsibilities thrust upon shop stewards. Bryan Davies

sibilities thrust upon shop stewards. One such course, however, well established and onjoying a high reputation in the educational world applied by the suspension of the devolution debate provides MPs with corticr nights and only in the difficulties conferning intending stodants applying for discretionary awards.

This experience is scarcely atypical. Thus the very courses upon whileh recont Miniaterisl state-ments have placed great emphasis are the oues which srs likely to auffer most scutely from the cuts.

It is pointless of the Department to be preccling the volues of many sub-degrea courses for their high vocational relevance and high practical coutent if the system of student them.

Nowbere, however, is there o greatar danger of missed oppor-tunity in British education at pre-sent than in the reorganization of seut than in the reorganization of the colleges of education. This government is destined to carry the incubus of the sharp reduction in teacher training places. It should not risk the added charge that it naglected the opportunity of a fresh and constructive role for the colleges which remoin.

leges which remoin.

Presaut policy hos been one of crude reallocation of resources operating against criteria which have been far from clear or consistent. Soma colloges, having morgad with polytechnics, are probobly locked into lacrossing omphssia upon degree leval work. Others have been linked togsther to maintain predominantly their traditional role in tracher education.

Far too many of the new institu Far too many of the new institutions, however, appear to be biddard
in the increasingly compositive
market of degree-level atudonts. The
Department and this local muthorities could have defined e rols for
their future in very different terms.
They ahould have been ancouraged
to davelop their links with further
education colleges and to develop
sub-degree-level work. This would
have brought added breadth of opportunity to a student category portunity to a student category which will clearly expand over the

next dacada.

It is, of coursa, by no maans too late for such a restructing to taka placo. Nevertbalesa, such a radical changa in rolas can probably ba achieved only noder e period of intenso prasure. The danger is that the colleges which have survived the ultimate threat of closure will persion austaining existing values and adulcational programmes orianted to the more acadaoic students. Thus a Government committed to increasing the opportunities for 16 to 19-year-olds will bave allowed a scorca resource to develop ths next dacada. wider than the further education sector, but developing its strength in relationship to part-time study and skill dovefopment may hove been sadly neglacted.

Economic recovery will be a few to be a

"Never heard of them".

"You must excuse my wild, else once worked in plustry." He grows confidential, "She worked for a bawildering erray of problams, the establishment of this Technician Education Council and the Business and it has affected her priorities."

Eventually they con him out of four Persian carpets and a package holiday in Tierra dal Puego. To give holiday in Tierra dal Puego. To give holiday in Tierra dal Puego. To give partiamantary chellangeo on the ger some foreign travel while they iors filming it) you are advised to include a scene whare the brothers lare orrasted dancing has come a in the establishment of this increasing to tachnological unemployment to your work (and partiamantary chellangeo on the fallure to make progress on implamenting the Russell report sents to satisfy the diverse requirements the calculation to satisfy the diverse requirements to satisfy the diverse requirements the satisfy the diverse requirements the satisfactor in the years and daunting challange will rightly damand en increasant the calculation.

In adult education, however, the Government's banner looks consideration.

Government's banner looks consideration to tachnological unemployment in the provi

THOMSON WANDERER HOLIDAYS The price in the brochure is the price you pay.

Only Government sollon can allect these prices.

brochure or ling ue on 01-387 4461.

Government levy.

ATOL 152BC.

### One over the eight As a champion of the onderdog, I now offer a unique account of the bost race in which no mention is

lization in higher education to make in which no mention is mode with the annual conference of the Proposition of Colleges implessing the Diploma in light Feet annual for the development of the mode of either the Oxford or Computer on the annual conference of the computer on the reserve teams, Isis and Goldie, who, it seems to me, and the Birmingham lass with a get a premy may deal.

Not for them television documentaries, nor press fonfares, nor luxury accommodation, nor free weekmore objective and closer to ref.

The tails the conference of the

He fold the conference of swooning women. No, they have to degree of specialization which find their own occommodation, the become characteristic of the End reducement of the end should be end should be end should be end should be end to the end of the end voice. They are also-roweds and, with the possible exception of Charon's how ride to Hodea, there These practitioners tum is

Professor Kettle warned the was becoming difficult to get teaching or research fully in a

'Ag ni had it dependshe, not no more tive attractions, was disaurous cause it tailed be provide a g balanced education and treasts ciplines, into something self-page

coplines into something self-pay mating arount.

Mr Paul Wright, o membor of last years their courses and universities tesses their courses around the training around the straining around.

Mr Paul Wright, o membor of last year's triumphant Isia crew, who has now been promoted to some other Oxford elght, said: "It is true they do have a tough time of it. I am sure they will appreciately and the straining around.

Afterwards along the straining around.

Mr Paul Wright, o membor of last year's triumphant Isia crew, who has now been promoted to some other Oxford elght, said: "It is true they do have a tough time around the straining around.

Afterwards along the straining around.

Afterwards along the straining around. said, this sestem was suimble at

to the fit per cent or 15 per of of students gaining lits de houses. The majority of sude, had the uses specialist educaluct lurrause they failed to achieu

Dr Magnus Pyke is to ratire as secretary of the British Association for the Advancement of Scienca. If the extrovert sciencist has been unusually quiet on this out other. A concussed selfless bat:

true of merchanic transfer and the property of the

Tutorials, the cloistered caim of colleges, students on bicycles amid splendid architecture, are all part of Oxford University's 700 year tradition. But how has it coped with motiern needs, and how well does it work os an educational establishment? PETER WILBY wrote

"The place engulfs you—it wrapa itself around you rhetoricelly und mrchitecturally. It resists change, but minority of 10 per cent can make a milsanca of itself. ir also disguises change as continuity. That is how A. H. Helsey, Fellow of Nuffield Chiloge, describes the University of Oxford.

The result la that many Oxford courses, particularly in the orts, appear erchaic, Roman Low is still compulsory in the first two terms.

The most striking aurface characteristics of Oxford are conservatism of the jurisprudence degree. Two
unt of six papers in English Litera-

seristics of Oxford are conservatism and self-confidence.

Ar times, the self-confidence becomes suffocuting emplacency. Oxford dons are nut given to critical questioning of higher colucation. If you osk nbont lie value of Oxford's history, PPE or Greats courses, you are told that there can be nothing much wrong with them because lidustry, the professions and, above ell, the civil service contitua to recruit the graduates.

unt of six papers in English Literature prelims are on Anglo-Saxon. The theology degree atructure is almost unchanged since 1923—six out of eight honours papers or on Biblical studies, and Greek is compulsory.

The largest honours papers or on Biblical studies, and Greek is compulsory.

The largest honours achool in the university is still modern history. Lust year, it had 284 finals cundidates out of the total 2,735 cumpared with 268 aut of 1,305 in 1939. Its examination regulations open with the statement: "The examination of the control of the

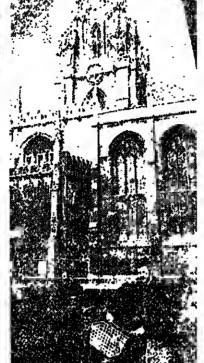
It does not occur to anyone to inquice whether the post-War performance of say, the British civil service is wholly antiafoctory, and whether Oxford might not be abla to

The standard of the standard o

Its exomination regulations open with the statement: "The exomination in the School of Modern History shill always include the History of England. The "History of England meons a continuous survey from Roman threa to 1939.

Even though the regulations mention occurring the regulations

Colleges keep tempo of chan The great 'handicap race' at slow, slow, oh, so slow in the entrance stakes



and technology about universityluthstry relations about that universities of acodemic efficiency
that indeed a universities of acodemic efficiency
success in acodemic efficiency
that the interial, indeed a
success in possite its conscious efforts, Uxford was "vulnerfew younger done angerable to the suspicion of privilege
about it, arguing that grant and social instice." Despite its conscious efforts, Uxford was "vulnerfew younger done angerable to the suspicion of privilege
about it, arguing that grant and social instice."
The three tubles below show that
oxford has genuincly tried to success
the property of success in admitting a research carried out in these departments was of little televance to linkustry". But Oxford, he its near stealthy way and at a pace appropri-ute to a 700-year-old noiver-sity, is setting about putting these things

right.
There is a university industry committee, which finds people who can meet requests from industry for spe-chalist advice. Characteristically, Oxford, unlike some ather naisersilies, has not set up a formal laircan but an essentially informal network which, though it started with a fulltime secretary recruited from ICL naw relies upon the part-time services of a Registry officer.
There is a noiversity centre for

management studies, whose activi-ties have expanded steadily over the past II years, it is concernly planning to set up a reaching company for engineering science students. The centre's visiting staff includes Bill Webistein, a Balliol politics toner. Some four years 1996, Webistelp and a few other does started a series of extra-curricular seminars at which thous and undergraduates could meet people from the business world.

"The idea", says Weinstein, was not to sell industry but to purover the realities. We got people to talk ulout actual cases of decision-marking. That all lead stimulates integrated than it might of colleges—and this year, for the

Addrew Glyn economic lack of success in admitting a Carpus Christi, said: Whigher proportion of maintained interials on the same of school pupils raises the question of

he deadening. You resel whether it has tried hard enough, an awfed for of the time h. Among men, despite drametic

procedures over the past 10 years

bas been the expansion of the pre-

have no provision for a third year

post-A level emrance examination.

changes in their origins doring the that interest you and in 30 years before Franks, there has the student. You have been very little change since the everything." You can't concentrate out Duns like Glyn argue, a The chief reform in Oxford entry Franks Commission that it use of classes and least lift the load of coversometimes threatens to say A level entry routes. This was suptutorial system la fact de posed to be to the odvontage of become increasingly as maintained schools, many of which

Clark Brandin, scales to sixth form preparing students for o Jestes, an engineer sed as lev lecturer, orgues that he bene ins different kind of First, candidates were permitted to ia different ways.

reduce affelligent, educable important to the confege. No con-technical transfer in the confege is the more than a limited number of scholarships. It a student's first preference college is a physics to or said: "We do try unable to offer him a scholarship, to spot the public school people the candidate must then accept an who are just well drilled. But offer from any college lower in his who are just well difficult into order from any conege invertion in we've got to take attainment into occount in they simply can't start the charge."

The months of the inexast science of the first preference col-The results of the mexact science lege for an ordinary place.

of Oxford admissions can be seen in table 3. The statistics leave little grades is sumped up olmost without a second glance. At the other end of the scale, a mointained school can-didate with poor results is more likely to get a place then an equiva-lent independent school condidate. Abolition of the entrance exam

ces in the rates of success for stu-dents in the large middle category of "good" A level results. And it is among the pre-A level candidates thet the independent schools estab-lish the major advontoge that gives them, averall, a higher success rate the very able studes; year (or fourth term) of sixth-form three pages and studies. Arts and social acience candidates for conditional offers.

The very able studes; year (or fourth term) of sixth-form schools (or, rather, schools with three-year sixth-forms) submitting candidates for conditional offers.

The carra kelp key didgues take the same popers os tho But, although the occeptance rute for conditional offer candidates is lower than for prc-A level candi-dates as a whole, this does not ex-plain the discrepancy. Ironically, the

somewhat stronger compliasis on recative design) was that they would isolate engineering science from physical science. It is a firm thaterial physical science, it is a firm thaterial physical science, it is a firm thaterial must chosely attained to their intellectual contest attained to their intellectual contest, are the exponents of their intellectual contest, are the exponents.

Last year's report by the Common select committee on science and technology about university-for the students, are to commission, "completely meet the number of value of total research contracts with the other contests of the othe

The system is a delight to college dould that the really good main-tained school man while high A level grades is sumped up obnost without others. An Oxford that once wrote that the students no more under-stude their real role in the scholarship system than did the harses at

There ure, however, no differen-es in the rates of success for stutained schools. And this would probtained schools. And this would probably have more benefits than any system of more refined handicapping. Oxford's main admissions problem is still that it does not attract sufficient numbers of state school, eardidates. The multianed school, as Table 2 shows, is still inclined to believe that Oxford will take only candidates with the very highest A level results.

Christ Church, Oxford.

Poor get less poor but the rich stay rich the rich stay rich the recursions.

ther it is desirable that academic tolent should be more heavily con-centrated in Oxbridge rather than in

If Oxford could attract more men Oxford is more expensive than most versities is in ignore the equally and women from state schools, even at the cost of lower entry standards, it would have little to fear. (Whe and university endowment income, and university endowment income, but the charge per student head on public funds is still higher than

In 1974-75, the richest college (Christ Church) had a standory en-downest income of £653,454, while



Battial is readificually Oxford's cleveres; college. But it slipped to fifth place in the Norrington Table though it originally planued to join ritual noises about the entrance last summer and was narrowly pipped by Magdalen for the highest leges in 1974. It backed out largely beginned to the public schaul entrants currying beginning to the public schaul entrants currying beginning to the public schaul entrants currying beginning and the public schaul entrants currying beginning and the public schaul entrants currying beginning and the public schaul entrants currying the public schaule. Maurice Keen, the admissions that, makes the public schaule and the fifth place in the Norrington Table last summer and was narrovly pipped by Magdalen for the highest number of firsts (22 agains 21).

This is widely regarded as failure. Indeed, on their records over the last decade, Cornus Christi and Merican Merican Market College, asked and, along with New College, asked to be still more awkward and, along with New College, asked to be schools as Winchester, Clifton last decade, Cornos Christi and Merand, along with New College, asked schools as Winchester, Clifton ton might now have stronger claims the Congregation for permission to and Newcastle Royal Grammur.

leiaurely, gentlemanly traditions of The college was founded in the

middle af the thirtecuth century and one of its earliest masters was John Wycliffe. But its mest famous head was Benjamin Jowett (of whom it was claimed that what he knew not was not knowledge), almost the last man in Oxford to appear before a university court for heresy. That is a source of great prida to the current Master, ex-Commonist Party member and controversial Marxist historian, Chrlstophar Hill. Balliol has one of the most ailvanced systems of student representation in Oxlord-the students have five out of 21 places on the key executive committeelargely because of Hill's support.

More than a quarter of Balliol's 430 students are graduates—ths highest proportion of any undergradoate collega. It also hos a high concentration of social scientists. with more PPE men (accounting for more than one-sixth of its undergraduata intake) than may other collega.

#### Languages 'to learn in spare time'

m m

Fr

What Balliol does not heve, in any quantity, are gaography or theology students. And, until recently, it did not take students to rend modern lenguages, apparently no the grounds that Jowett thought unyone worthwhile ought to be able to leurn a language in his spare time. Now it has a small cohort of modern linguists, and ite first longuages fellow was also its first woman fellow. She is Mre Carol Clark, who says

that the minority in Balliol who are Cambridge, Landon and Scotland, and pleased to see a woman there with a Liverpool graduate providing are, in any case, the very people who would have scruples about being unpleasant to comen-" so everyone

is very friendly". Nevertheless, Halliol still does not ton might now have stronger claims to pre-eminence.

Bulliol's reputation for eleverness dates back to the unacted the first tucy, when it was one of the first Oxford colleges to take open examinations sectiously and challenge the leiaurely, gentlemanly traditions of the first leiaurely, gentlemanly traditions of the first leiaurely, gentlemanly traditions of the first leiaurely agentlemanly traditions of the first leiaurely, gentlemanly traditions of the first leiaurely, gentlemanly traditions of the first leiaurely agentlemanly traditions of the first leiaurely agentlemanly traditions of the first leiaurely agentlemanly traditions of the first leiaurely and summediately and women agentlemanly traditions of the first leiaurely agentlemanly traditions of the first leiaurely and women agentlemanus to file stantates to mimit evenes women agentlemanus to stantate to mimit evenes are filled, the stantant must be approximately equivalent. In the stantant must be approximately equivalent must be a stantant must be a st an official go-onead in women undergroduates even though it does not necept that the antiversity has any right to prevent it admitting women an interest women, and the antiverse a moral abligation.", Christopher Hill says, "but not a legal obligation."

Somewhat to its embarrassment, Balliol is o comparatively wealthy collega. Its statotory endowment histories in 1974-75 (the amount liabla to taxation under the college contributions scheme) was £232,036, making it Oxford's tenth-richest college. Its financial security was greatly hoosied by a private 700th anniversary appeal in 1963, which raised tha remarkable sum of £1,050,000. It spent half of this on new buildings (including a groduate centre ond a sparis parillon) and half on the crention of new lellowships. The majority of its endowment income is from interest and alvidends—the college sold its inst agricultural land in the mid-1960s. It owns several blocks of shops i intowns like Sollhull, Petersfield, and Chippenham. Some of Ibilliol's orerhends appear relatively high. This, Brigadier Jeckson, the Borsar, soys, is hecousa "we pride ourselves on poying our domestic stoll o decent wage." The students benefit from some of Somewhat to its embarrassment,

dier Jeckson, the Borsnr, soys, is hecousa "we pride ourselves on poying
our domestic stoll o decent wage."
The students benefit from some of
the lowest charges in the university.
Balliol's room reats are graded, with
position (on the quiet inside or the
noisy ootside of the college) os well
as room size, determining the price.
But wherever they live in college,
students are unlikely to have a view
of onything bot the most stouningly
inclegant urchitecture, looking like
sometiling out of a Gothic fontasy.
Balliol's old bays tend in he
famous, successful, and well-heeled
There is a certain superbrite and

the solinary representative of English provincial university.

The students are tairly mixed, although the maintained school entry is slightly lower than far Oxford as a whole. Manrice Keen, "in a world of piety" an a Sunday amorting, "from proud infidels alone procludined their dissent; four ludiums from the gates of Hallful, in freshly-laundered white flunnels and neatly pressed blazers with snow-white turbous on their heads . . . . making for the river".

#### Three essays a fortnight

The JCR, physically, is the most The JCR, physically, is the most spacious and the most well provided in Oxford (the nuntry serves five meals a day). Pulitically it has a tradition as the most left whig in Oxford although it is corrently rather subdued. The callege has always cultivated an "anti-licarty" lunge, yet it is now winning a few sporting cups and it has always had its share of dining this, including one for bontmen (with on after-dinner tradition of attacking neighbouring Trinity).

Balliol puts a great tienl of



Top to battom-almve : Hulliol, S1 Peler's, S1 Ame's. Christ Church, St Edonmi, Noffield.

A STATE OF THE STA

#### St Peter's-the poor college St Pater's was opened in 1929 ee n

permanent private hall, mainly for poorar etudents intanding to ba ordained. It was the evangalicals' ordained. It was the evangalicals' answer to Keble. The founder was a retired Bishop of Liverpool, and the first Master became Bishop of Rochester. Its chapel was bulli in 1874 as a perish church and, until 1961 the Master was also the Rector. Although the college retning o vaguely acclesiastical air and has a strong Christian Fellowship, the currence Master, Sir. Alec. Cairhorom, professes the new 10d more sinister.

processes the new and more singular of the new and more singular of the seconomics. He was aconomically the seconomic of the Government from 1961 to 1964, than heed of the Government Economic Sarvice until 1969.

Sir Alec, a Glasgow graduate and now Chancellor of that university, is one of the few senior college members with a non-Oxbridge background. Mineteen of the fellows and lecturars took their first degrees at Oxford, six at Cambridge, two in Scotland, two in the Republic of Ireland, and one overseas.

St. Peter's is a smallish college (250 undergraduates), but prides itself on the friendly otmosphere of its inflergraduates, 45 per central sections based, compared with the Oxford average of 34-per central oxidents indignts. There are no Greate fellows.

St Peter's did not become a foll collego, with a charter, until 1961.

The charter requires a three-quarters majority of the fellows to change the statutes to admit women, and the collego is corrantly struggling through that procedure, Thero is some opposition to going mixed from a few older fellows, such as the senior totor, Reg Perman, who is worried about the future of St Peier's rugby, already in decline after the collego reached the finels of Cuppers several times in the college reached the finels of cuppers several times in the college's reputation for good music.

The college viea with St Catherine's and Oxford's reports. St. Peter's college's reputation for good music, the college viea with St Catherine's (the only other college reduced this century) for the distribution of "blairs Oxford's reports."

Jeremy McGahan, the JCR press.

The college ls not moded in acuments of intensity below average, and it was the bottom college of the college of the college of the college is usually below average, its performance can be described as "fair to infidling", especially in viow of the unglomoroos repotation, and in 1975 it came atteenth out of 28 colleges, St Amne's priminated in 1875 it came atteenth out of 28 colleges, St Amne's priminated in 1875 it came atteenth out of 28 colleges, St Amne's priminated in 1875 it came atteenth out of 28 colleges, St Amne's priminated in 1875 it came atteenth out of 28 colleges, St Amne's priminated in 1875 it came atteenth out of 28 colleges, St Amne's priminated in 1875 it came atteenth out of 28 colleges, St Amne's priminated in 1875 it came atteenth out of 28 colleges, St Amne's priminated in 1875 it came atteenth out of 28 colleges, St Amne's priminated in 1875 it came atteenth out of 28 colleges, St Amne's priminated in 1875 it came atteenth out of 28 colleges, St Amne's priminated in 1875 it came atteenth out of 28 colleges, St Amne's priminated in 1875 it came atteenth out of 28 colleges, St Amne's priminated in 1875 it came atteenth out of 28 colleges, St Amne's pri

Queen's growth of the men's college view with Standard with a retained property law property law

Harrist Commencer Control

thry would run the plate is 55 per cent, the mointeined achool run the plate is 55 per cent, the mointeined achool entry is above avorage for women's colleges. Mra Treoaman says: "We try get as wide o catchment area as poecible." But although the college lotronoced conditional offers last year, the principal is "not wholly assisted" with the new system. "It is better to compare people at the eame point and on the eame critoria", she says.

St. Anne's is a mointeined achool of the college is not wholly assisted with the new system. "It is better to compare people at the eame point and on the eame critoria", she says.

----- GOLLPRIENT

although the codlege letrosloced conditional offers last year, the principal is "not wholly artisfied" with the new system. "It is better to compare people at the came point leave by indininint (2 and a strength of the lowest in the leave system. "It is better to compare people at the came point and on the came critoria", she says. St Anne's is a political (once red, now fading pluk) rather than hack wall is the lowest in the sporting college. Lest summer it was the only college not to have building to contributions referred to the raine of its endowners. The college was the first to have far the raine of its endowners and moste acciates.

Christ Church

could invent.

Its arigins stretch back to the eighth century when a monastery, later developed into the Priory of St Pridescrile, was established on the site. This priory, together with some 21 small houses, provided the capital for Cardinal Wolsey to begin in 1525 the building of his falulous Cardinal College, of which it was smill that, had it been finished as with a cone exactly the milyersity with a cone exactly the milyersity. in 1525 the building of his faintous Cardinal Cullege, of which it was said that, had it been finished as it was begun, "it might well have excelled not only all colleges of sindent- but also palaces of princes".

Alas, Wolsey fell from power.

Nearly 20 years later Hearry VIII tofter having the cardinal's hats contout from all the wallst revived. average

removel from all the walls) revired the college as Christ Church and combined it with the cathedral of

the college as Christ Church and combined it with the rathedral of the new diocese of Oxford. The head of the college is also the head of the college is allower them the inext day, the bullot bax was the carrent beautiful to see the price of one. The done are called Students of the man determative, in the inajority of students still prefer the traditional.) Undergraduates go bengling (very few nowadoys, admittedly) and vote Conservative in a proportion of raughly live to one. The dons are called Students, os Wolsey christened them four centuries ago, and they include lour canonical professors, three of them appointed by the Crown. When the university tried to secularize the professorships some years ago, it found less dan half-a-dozen supporters in the Christ Church SCR.

The college is not alwars here infiliated to DISU and has always paid its subscriptions.

The univergraduates are pro-Christ Church more than they are prin-inty-thing else. Despite the numbral standling os a delegate to an NUS conference polled a heavy majority in the college because he was a Christ Church man.

The cullege is not alwanced in provision for formal undergraduate participation in its affura. Richard Rawlinson soys: "We don't hother with lormal procedures. We go along and have a chur with die conject the professor ships some years ago, it found less dan half-a-dozen supporters in the Christ Church SCR.

The collega has a Russian prioce called Obolensky among its done in the college is better run by the senior members than by JCR lacks."

In troth, the ondergraduate college is better run by the senior members than by JCR la

the wurs). When Franks reported, 71 per cent of Christ Church's undergradoate entry came from independent schools—by for the highest proportion in Oxford. When Congregation mot this month to consider lifting the restrictions on collegea going inixed, six Christ Church dons—more than from my other men's college—were among the significates to the motion for

All this is nort of the college's

Nuffield—for

Tich college

Christ Church, combining a college and a cathedral in a single legal and financial entiry, is the kind of institution that only the English could invent.

Its arigins stretch back to the college when the control is a single legal and financial entiry, is the kind of institution that only the English could invent. people there were stupid."

He might have added that Phrist

The JCR is applifical rather than The ICR is apolitical rather than actively conservative. In a recent by-election for a place on the Oxford University Student Union executive, Christ Church undergraduates behaved in precisely the manner that Christ Church undergraduates are popularly thought to behave. On the first day, the bullot box usas thrown in the river. On the second, it was tolen. Once retrievel, it was lilled with black link. Yet the ICR has alwars been ulfillated to DISU and has always paid its subscriptions.

in theory or lifetingly except mining the economists.

Nuffield prides itself on its involvement with the world of princical affairs. Fellows lare to drop the names of goliticians with whom they have lunched. Most have had a spell in the Civil Service or advised the British or some foreign government. Sir Norman Chester, the Worden, once observed that

the Worden, once observed that the problem is not how to create links, but how to retain the mensure of alcolness necessary for an academic independent. for their whole three years of Oxford (some of them loxurious),

Former Students Include Glod-stone, John Locke, William Penn, William Walton, Charles and John Wesley, Lord Hollsham, W. H. Auden, Lewis Corroll, and Schastian

schools than in the part. Bur-Richard Rawlinson, the JCR Presi-dent, himself an Ibb Laguran, says Loganted in 1937 by Lord Satheld twho ilonated a site and some 1900,000 for endowntents), Notrield College is "for prorgadiance work

especially in connexion with the study by cooperation between aca-demic and non-tendence persons of social finelading economic and political problems." Its 79 current audents are coughly equally divided between economics, politics and sociology, Twenty-boar of theor are Oxford graduates, four are from l'ambridge, one from Landon, 15 from averseas, 14 from provincial, Scorristi and Northern Irish univer-sities, and one is a polytechnic with a some exactly the university

an internationally formous cathedral choir and a palatini new sports

reside is that one is readinfied of almsbonies. But the study facilities are superfix, a library with liberal lembing laws, a free Xerox service, a componer and studies for all the stu-

dents, whether they five in or out a The rimble, as some student pointed out, is that there is little cause or incentive to wander out in cause or incentive to wander out at the college. The social life is some-what recordined, even stanted. No-body goes in for with or musual left-aviour, perhaps because the cal-lege is built in such a way that everyone ran see what everyone else is doing all the time.

And the college is essentially an academic scaling more in which

acidemic mairing ruom, in which there is growing anxiety that the trein carrying jobs is no longer a reliable service. The great majority of past Suffield students are now in

university pasts.
The college minimizes distinctions graduate. Nuffield was the first mixed there has been no permanent woman fellow. between senior and Junior members. The students have representatives and voting rights on all bodics, in-cluding the governing burly. Though they are excluded from "below the line" business (such as student prowoman fellow.

The college is the hoose of Pavid Bonler (Nulfield election studies).

A. H. Halsey (social mobility study), and Phillp Williams (Gairskell biography). The atmosphere is severely empiricis—there is little interest in theory or bleabagy except mining the economists. gress reports to the student representatives get the full infinites.

Students and thous ent at the same tables, taking their sears according to the order in which they enter the thining hall. It van full yourself next to a stranger on such occa-sions, the usual opening gambit is: What is your research Held?" More profound academic alsenssion is said to take place over afternoon

The callege is not athletic, nor even particularly political. But there is a strong and active football team, encouraged by the Warden, who has close connexions with the Fourball League.

Measured solely by its 1974-75 endownent laconic, Nulfield is Oxford's third richest college, after St John's and Christ Church. The Wurden refuses to reveal the value

of alcolness necessary for an academic jodgment."

The college also has a set of visiting fellows who inclore jack Jones, Sir Robert Mark, William Whitelaw, Sir Compbell Adamson, Len Murrsy, Eric Varley and Sain Britan. The honorary fellows include Edward Heath and Jim Collaghan.

Sir Norman odmits that there is an apportunity of the visiting fellows. Most of them are teo busy to turn ap more than once or twice u year. Some students complain that, when the fellows no visit, they are not osked sufficiently probing questions and that students hove too little opportunity to talk to them.

A stone's throw from the railiway stotion, the buildings attempt to look old but are, ef course, new. The

delay.

All this is part at the college's traditionally, one-formed large—only the state least his part of the college's antiony on the state of the over the state of the over the state of the state of the over the state of the state over the state of the over the state of the over the state over the

The college was the first to lave a norsery—to titls day, only out of the concept college provides one and the cost is 19 o week.

The norsery is open 48 weeks ever and the cost is 19 o week.

To rolls 360 oudergraduates and 120 for the concept and the cost is 19 o week.

To roll and the cost is 19 o week.

To roll and the cost is 19 o week.

To roll and the cost is 19 o week.

To roll and the cost is 19 o week.

To roll and the cost is 19 o week.

To roll and the cost is 19 o week.

To roll and the cost is 19 o week.

To roll and the cost is 19 o week.

To roll and the cost is 19 o week.

To roll and the cost is 19 o week.

To roll and the cost is 19 o week.

To roll and the cost is 19 o week.

To roll and the cost is 19 o week.

To roll and the cost is 19 o week.

To roll and the cost is 19 o week.

To roll and the cost is 19 o week.

To roll and the cost is 19 o week.

To roll and the cost is 19 o week.

To roll and the cost is 19 o week.

To roll and the cost is 19 o week.

To roll and the cost is 19 o week.

To roll and the cost is 19 o week.

To roll and the cost is 19 o week.

To roll and the cost is 19 o week.

To roll and the cost is 19 o week.

To roll and the cost is 19 o week.

To roll and the cost is 19 o week.

To roll and the cost is 19 o week.

To roll and the cost is 19 o week.

To roll and the cost is 19 o week.

To roll and the cost is 19 o week.

To roll and the cost is 19 o week.

To roll and the cost is 19 o week.

To roll and the cost is 19 o week.

To roll and the cost is 19 o week.

To roll and the cost is 19 o week.

To roll and the cost is 19 o week.

To roll and the cost is 19 o week.

To roll and the cost is 19 o week.

To roll and the cost is 19 o week.

To roll and the cost is 19 o week.

To roll and the cost is 19 o week.

To roll and the cost is 19 o week.

To roll and the cost is 19 o week.

To roll and the cost is 19 o week.

To roll and the cost is 19 o week.

To roll and the cost is 10 o week.

To roll and the cost is 10 o week.

To roll and the cost is 10 o week.

To roll a

# Keeping standards high in chemistry

chemistry as a technology to make outside world with an active rule a belated but decisive contribution in the government of the profession. to the Industrial Revolution. The most argent problem facing the institute was the need to define what was meant by a qualified what was meant by a qualified chemist, and to decide the criteria to be used its setting on standards of public health, control of pollution and prevention of the eduleration of food.

There was however the problem of the task, but it was tackled with the profession. The government of the government of the government of the profession. The most argent problem facing the institute was the need to define what was meant by a qualified chemist, and to decide the criteria to be used its setting on standards of education and training for chemists. This was a formidable task, but it was tackled with the

thon outside the universities and major technical colleges that could protect the public from the chemical charlatan by defining a properly qualified chemist, or could serve the new profession of opplied chemistry as the engineers were served by the Institutions of Ciril and Mechanical Engineers.

The Chemical Society, founded in 1841, was a leorned society, and its members thought that professional matters were inconsistent with its cherter. Accordingly, ofter who we should now coll a "feasibility study", the Institute of Chemistry of Great Britain sod Ireland two constituted in 1877, and received lits royal charter in 1884. (It was not until 1944 that it was granted the prefix "Royol" and its title shortened to the Royal Institute of Chemistry in a new royol charter granted in 1949.)

In the early years all the chamists of sufficient distinction to serve on the connecil of the institute had to be throw either from a properly dualified chemistry in a new professional charter in the chamists of sufficient distinction to serve on the connecil of the institute had to be throw either from the chamists of sufficient distinction to serve on the connecil of the institute of that the final examinations for the associateshin (the moin membership") would be examined "membership") would be examined "membership") would be examined in theoretical chemistry. These bore a earong resemblance to final degree papers, which was hardly surprising since the examination of in theoretical chemistry. These bore a earong resemblance to final degree papers, which was hardly surprising since the examination of the institute that the victuations of their institute history of these who conditions only practical exominations were also papers at a high stondard in theoretical chemistry. These bore a earong resemblance to final degree papers, which was hardly surprising since the examination of the institute the full professional constituted in 1877, and received the theory papers, but the location of the final exominations were usually univ

Chemistry in o new royol churter granted in 1942.)

In the early years all the chamists of sufficient distinction to serve on the council of the institute had to be drawn either from industry or the public service, or from the clemiatry departments of universalizes. The first prealdent, recognized inestitution, and mexpected direction. In 1920 that it was possible for five colleges, at 1920 that the regulations were members of the Council of the many of his successors, as well as members of the council, examiners and honorary officers bave been (and still aro) of the council, examiners and honorary officers bave been (and still aro) of the council, examiners and honorary officers bave been (and still aro) of the council, examiners and honorary officers bave been (and still aro) of the council, examiners and honorary officers bave been (and still aro) of the council, examiners and honorary of the council, examiners and the institute agreed to participate the necessary resources.

Thus the regulations were uniforally one developments cone from a purpose of the council, examiners and the institute agreed to participate the necessary resources.

Forther developments cone from a composition of the first preadent, and the regulations with the inverse of the first preadent, and interesting the introduce at transitional candidates for five colleges, at the council preading the proposed contraction of the Royal of the institute agreed to participate the necessary resources.

Forther developments cone from the legistic preading the institute agreed to participate the necessary resources.

Forther dev

In the 1870s the advance of chemical knowledge was gaining mooren-tom to Britain, and was enabling ledge and of its applications in the

edulteration of food.

Thero was, however, no insiltucuargy and sense of propose thou outside the universities and characteristic of the Virturian real.



"Theory and practical application": the limely motto on the Royal Institute of Chemistry's armorial beneings

-it was inevitable that in the course of time more colleges would course of time more colleges would attain the standard of teaching and tesources that would coable them to be recognized for troining sindents to the associateship level. In these developments the lastitute played an important part, through its policy of periodic inspection and approval of calleges, in reconsagement in calleges in raise educational stondards and in persuading local authorities to pro-

spection and approval of colleges to roconsegement to colleges to roise educational stondards and in persuading local authorities to produce the necessary resources.

A point was reached in 1957 when it was possible for five colleges, at Brimingham, Bristol, Hull, Liverpool and Solford, all of whom had an outstanding record in preparing candidates for associateship of the institute, to be placed in "special relationship", to set their own examinations subject to moderation by the institute's oxnamers, and with a secretary to the institute's oxnamers, and with a secretary to the institute's oxnamers, and in the associateship. For this in limits to devisu their own experiments was extended in 1968 and none in was extended in 1968 and none in the secretary was extended in 1968 and none in the secretary was extended in 1968 and none in the secretary was extended in 1968 and none in the secretary was extended in 1968 and none in the secretary was extended in 1968 and none in the secretary was extended in 1968 and none in the secretary was extended in 1968 and none in the secretary was extended in 1968 and none in the secretary was extended in 1968 and none in the secretary was not consistent with the original idea of a professional experiment at all levels was not consistent with the original idea of a professional experiment with the original idea of a

THE PROPERTY OF THE PROPERTY O ber of students with the qualification felt there advantaged by the left at fessional states.

In response to race from many source to a structure to the Nadostic colleges, the council her production of the requiring a successful and arching a successful decided chemistry is the council or applied chemistry is the council or applied chemistry is the council of approved extremely popular tive there are now so times, and, many other times, it led to the council of the council or the council of the council of the council or the counc

The growth

of realism

in student

politics

THE TIMES HIGHER EHOCATION SUPPLEMENT 25-577

unions in the TUC.
An ideological identification with

the working class which is emposed to identify the students of 1968 has been supplemented—ond possibly even supplemented—by o hard-nused ecommic identification with the interests of the labour

against government policies, the most significant being the 1972 miners strike.

These are some of the mointrends which differentiate the student movement of 1968 from today. In the immediate post three years, it is the existence of a Labour government which hos transformed the situation; the Labour movement

A page open to all those who leel they have something of value to say on topics of interest and concern in higher and further education



## Temporary promotion: a substitute for mobility

Academic mobility as we know it in the Pigos is rapidly becoming a thing of the past. An longer is it always possible, even in North America, to follow the advice vanden Berghte gave to the academic carecrist: "When in doubt, move". Despite the apparent multimble of ads in THES there is often today anwhere else to go.

ands in THES there is often today unwhere else to go.

A falling birthrate, combined with the manifold pressures of inflotion, has meant that in all developed countries academic jobs are becoming thinner on the ground mall horder to get. It also has meant that as the possibilities of unwing appearance by moving autivates graw less, more unwinds while remaining within their own institutions.

Perceptions of how best to do this Perceptions of how best to do this will accessarily differ from place to

will accessarily differ fram place to place. If at one institution promotion is made heavily dependent upon research, there will be a Godarene-like rush away from teaching and administration bock to the library and the lubratory.

If at onother adolhistrotion or teaching is perceived as the way on their ocalemics may feel compelled to neglect their own subjects and make a heeling for the committee room or the terriary teaching institute. Either way their proper insitute. When it cames to self-justification it is only too easy in adday's climate to sit lock and rejoice in tenure and tho prospect of a reasonable pension.

able pension.

To avoid this happening on an

To avoid this happening on an ever-increasing scale we must try to preserve acodemic mubility can bring the benefits that mobility can bring not only to the avoile individual but also to the institutions between which he la able to move.

One method of prosarving a degree of mubility has been tried already, but the results hove not been happy. This is the practice of ensuring that junior foculty continue to move around by granting rham only limited tenure, if any, and expacting them to move elsewhere at the end of o few short years.

It could also provide a greater number of incentives than the present inflexible system at no cours cost. Indeed, there could well be a hidden soving in the matter of supersonuation costs as regulal competition tended to fewour the younger and nore active faculty and fewer academics retired in grailes above that of lecturer.

Finally, the principles of the system over not present inflexible system at no cours cost. Indeed, there could well be a hidden soving in the matter of supersonuation costs as regulal competition tended to fewour the younger and nore active faculty and fewer academics retired in grailes above that of lecturer.

Finally, the principles of the interior present inflexible system at no course cost. Indeed, there could well be a hidden soving in the matter of supersonuation costs as regulal competition tended to fevour the younger and nore academics retired in grailes above that of lecturer.

Finally, the principles of the interior present inflexible system at no course cost. Indeed, there could well be a hidden soving in the antitive competition tended to fevour the younger ond more academics retired in grailes above that of lecturer.

Finally, the principles of the interior present inflexible system at no course cost. Indeed, there could well be a hidden soving in the antitive competition tended to fevour the younger ond more academics to the superson that the content of the present inflexible system at no course cost. Indeed, there could well be a hidden soving

where at the end of a few start years.

It is a proctice which has been likened in the past to en acodemic sweotshop, but infortunity it duplicates only the misery of the traditional sweotshop, not its efficiency, such as that wos.

Another modod, yet to be Iried, coloruppe transplant the advon-

to depend upon the same criteria as now, but promotion would no longer be for life. In acad any position above that of lecturer would be granted for a limited term unly, or least to the first instance.

The position would automatically fall vacant again after five or seven years sud would agoin be throwo open to cooperation. The academic who had held it would have the outlon of contracting for a second aption of competing for a second term and, if successful, would become eligible to compete for o higher grade, also of a limited term initially.

to compete, he would come to the point on the lecturers' scale which he would have reached by then had he not bren promoted. An additional incentive could be provided by making the promotion permanent at the end of the second or third

A system of this type could allou widely within on insulation than is possible at present, and it could go a long way towards assuaging the bitter feelings that are bound to orise in any organization where there is little prospect of growth, and promution for many becomes virtually a matter of "dead man's shoes".

It could also provide a greater

competition tended to fevour the ynunger and more active faculty and fewer academics retired in grailes above that of lerturer.

Finally, the principles of the system ove not notamillar to those in tertiory justimious. Limited term promotions may sound douger nusly radical, but the concept of in limited term ltself is well established in the context of udministrative ecademic jobs, such as doan altips or the choirmanship of departments. And few of us can imagine research finance which is out the stimplus of regulor competition.

# Medical education for the people

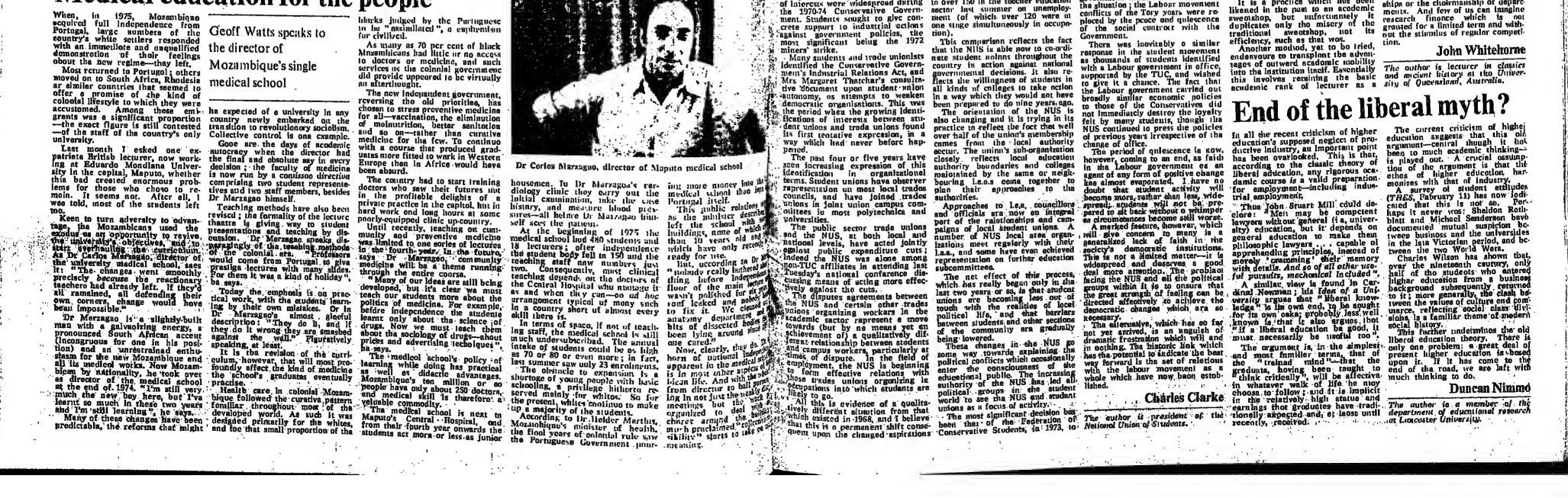
When, in 1975, Mozembique ocquired full independence from Portugal, large numbers of the country's white settlers responded with an immediate and anguellfied demonstration of their feelings obout the new regime—thay left.

Most returned to Portugal; others moved on to South Africa, Rhodesia ar almiler countries that seemed to offer a promise of the kind of coloolal lifestyle to which they were accustomed. Among these emigrants was a significant proportion—the exact figure is still contested—of the staff of the country's only university.

Test month I safed of the Good Collective control is one example. Good are the days of acodemic

blocks judged by the Puringuese to be "assimilated", o employeds for civilized.

As many as 70 per cent of black Mazamhicans had little or no access to doctors or medicine, and such services as the columbal government did provide uppeared to be virtually an afterthought.



Students: more, or less, political than 1968?

of student activity has increased dramorically between 1968 and 1977. possibly even suppliented—by o hard-nused economic identification with the interests of the labour movement as a whole.

Expressions of this identification of interests were widespread duting the 1970-74 Cunservative Government. Students sought to give connected support to industrial actions one stage simultuneously in occupation.

This comparison reflects the fact that the NIIS is able now to co-ordinate student noinns throughout the country in action against national governmental decisions. It also reflects the willingness of students in the document upon student union all kinds of colleges to take oction all kinds of colleges to take oction.

of students. It is a shift which is intensified by, though not dependent on, the inversence economic situation. In addition to the issue of relotions between students unions and trodes unions, a second development is the changed position and status of the Notional Union of Students. It is no coincidence that the level of student activity has increased

conflicts of the Tory years were re-placed by the peace and quiescence f the social controct with the



## Help needed to give more PhDs to minorities

denis to go to graduate work. A dun for a series of federally funded fellowships for minority students is now being discussed with the De-partment of Health, Education and Welfare, and the universities are confident it will be favourably

The plan has been developed by the Association of American Dul-yersitles, which represents the leadg research institutions in this

help universities recruit minurity students more effectively by souding lecturers nut to schools and settling up special maits to deal with minurity students' problems and money for graduate fellowships to be awarded by universities to qualied inflority students.

The alm is to increase the uru-

other major floids is low.

Universities are constantly urged by the gavornment in tealm more minority students in professional fields, and the programme of affirmative action?——special efforts in employ minority teachers in universities—depends on the existence of a pool of properly qualified minority FhD-holders lit all disciplinee.

The plan is in essence very simple, but it raises a number of difficulties. The must important is would need between \$5m and \$20m.——the exact appropriation would have to the exact appropriation would have to the vected by Congress.

A similar proposal hes inst head by the graduate deans cannother than the would be the made by the graduate deans cannother the mineral trailed make up the Committee an institutional Comportation.

In a recent statement they said:

It is one constantly urged have to the difficulties that a competitive institutional grants programme of institutional grants programme of institutional connection in a recent statement they said:

In a recent statement they said:

It is one constantly urged have to the exact approposal hes institution.

In a recent statement they said:

It is one constantly urged have to the exact approposal hes institutional connection in the proposal has included by the graduate deans cannother to find the proposal has included by the graduate deans cannother to find the proposal has included by the graduate deans cannother to find the proposal has included by the graduate deans cannother to find the proposal has included by the graduate deans cannother to find the proposal has included by the graduate deans cannother to find the proposal has included by the graduate deans cannother to find the proposal has included by the graduate deans cannother to find the proposal has included by the graduate deans cannother to find the proposal has included by the graduate deans cannother to find the proposal has included by the graduate deans cannother to find the proposal has included by the graduate deans cannother to find the proposal has includ

America's rap research universities utinistered. The Association of are origing the Government to do American Universities wants the more in encourage university stuggests to be paid competitively to grants to be paid competitively to those universities which show they have the experience, resources and commitment to increasing the number of minority PhDs. It would be un to eoch institution to select

recipients for the grouts. The observative is to set up national mosts fellowship pro-grammes, in which minority smalents compose for fellowships oworded directly by the federal government or its agencies, such as the Nutional Science Foundation and the National Endowment for the Humannities.

The disadvantage of this is that the disidentiage of this is that it is of more symbolic then proctical value. The lest minority students are in high demand anyway at gradiums schools, and there is no shortage of funds at aulversities to cusure that they are oble to take up offers.

The slin is to increase the proportion of Blacks, Chicagas (Mexican Americans) and American Indians who oncol in PhD programmes. At the moment the proportion is very small, Amang Blecks, postgraduate work is disproportionally concentrated in schools of chicatian, and the minimal proportion is chical and content in law, medicine, the physical sciences and other major floids is low.

Indiversities we construct a proportion would be used. A spokesman for the association thanges any programmo would need between \$5m and \$20m—the exact appropriation would

all disciplineo.

The plan is in essence very simple, but it raises a number of difficulties. The must importent is whether it would be legal. If followshipts were tenable only by designated minority gramps, this would roise the question of reverse discrimination, and unfairness to other minority groups such as Jews, and Orientals (though these are both well represented in Phi) prowa recognize that the environment of the most northerly university in the university in the most northerly university in the university, based in Eskinto the university on the university in the university

Dissident for California and Nobel Prize whoners signed on andocrinologist released from a advertisement oppealing for his released by mid-April. The legisleture lobour camp last week, noo been his leuse, and last year the Endocrins will probably give the university of his continued imprisonment saying his money, but officials hove his continued interpolation by the University for mis-

Dr Brewster-from Yole to the

vitad to locture in Colifornia. The invitation by the Universities of Stanford and Culifornia at San Francisco was issued while be was still sarving on) eight-year santence, and this may well have been instrument of the invitation to lecture in Colifornia on the land of the poly Clinic Department of the Vinnias proplement of the Vinnias very sensitive of the Vinnias proplement of the Vinnias proplement of the Vinnias very sensitive very the Vinnias very sensitive very

A touch of charisma in Grosvenor Square

When Dr Kingman Brewster moves to Grossenor Square as Duited States Anthussailor in Britain, Yale University will lose a president who for some years has been one of the most forceful and successful in America. He is virtually the only major university president to have survived the includence of the student report in the 1960s.

At Yale he has been a charisancic forceful and special properties of the student report in the 1960s.

At Yale he has been a charisancic forceful and special properties of the student report in the 1960s.

At Yale he has been a charisancic forceful and special properties of the student report in the 1960s.

At Yale he has been a charisancic forceful and special properties of the student forceful and successful in the 1960s.

At Yale he has been a charisancic forceful and influential Yale almonic, who have the successful in the wishes themselves mid admirable.

His designation as anthirable.

His designation as anthirable, and taking can include the wishes themselves mid admirable.

He wishes themselves mid admirable.

He wishes themselves mid admirable.

He also came to know the properties of the arrival properties of the properties of th student recalt in the 1960s.

At Yule he has been a charisataic figure since he assumed office in 1963. An international lawyer by training, he is outspoken, blum and pragmatic. He faced difficulties heed on ord, unlike many university presidents who were overwhelmed by the social and racial crisis on cumpus, Dr Brewster was rery visible and active in meeting

ralsing compaign ever seen in America—\$37001. This is now well hehind target, having received only \$180m and the campaign is the to end next December. Dr Brewster to end next December. Or Bretvster inilicated some time ago that he thought it would be time for him to leave Yale once the compaign was purporly launched. His critics say that it is his presence that is now holding up the campaign.

On the wider educational scene,

On the wider educational scene, Dr Brewster has established a reputation as a spirited civil liberturian, and a strong onpouent of Government interference in academic motters. Though himself a liberal, he is politically independent, having once been a Republicant.

dent, having once been a Republicum.

He is a strong defender of private universities, but has olso served on a number of nationol and regional education organizations, including a Government advisory committee on higher oducation, the American Council on Education, the National Educotional Telavision and Radio Centre and the American Academy of Ario and Sciences.

In recent yours he has been less

In recent years he has been less in the limelight, though he is nuw leading a compaign against Government control of medical education, ond he gave on important speech oud he gave on important special there are no obvious remain should not use the power of the yet for what must still be not the most influential ond by: purse to force universities to contho most influential and known to its wishes—even though ecedemic oppointments in &

Bologna University, the oldess in haly, has for the past two weeks been the thronte for a drung of start of his campaign, spent as a Chubb visuing felies a (as Mr Port) has just one, the two have maintained it. ountry.
In the view of many students and
of the city's Cummentst edudnistrators, student frustration has been
emloted in a deliberate attempt to
discredit the Communists in their comment for the past two years on onth Dr Biersster led s dept.

of higher education.

Of Brewster spent s agest semester in London in 1971; if gave an important speed by English Speaking Union in 1981; relotions between Britain 218 United States.

discredit the Communists in their strongest area and to undermine denocrocy in Itoly.

The shooting of a student, the subsequent violence and the police occupation of the university has been a great shock in one of the most tronguil and well-run cities in Italy. Student rebellion in Bologne has been milder rhan, for example, in Ronto and Milau and the crime and violence accurring in many parts of He served, of an early was Puris office of the Marael after the war. His purise dominate interest has been continual business law, especially a relevant to Europe : a relevant study a of the present government to outlaw the paymen of to overseas by United Sun 1 He lins oloo been active in E-

and Milau oud the crime and violence occurring in many parts of
Itoly are less acrious here.

The peaco was shettered on Morch
11 when pulice vero unexpactedly
colled in—a grave and exceptional
move for Itulian university nuthorities—to deal with incidents between
left-wing students and colleagues
from a Catholic student organization, Commitance a Libereziane,
which the forner regard on an offshape of the detected Christian
llemoral ruling porty. Netions ossociations, and me with Cyrus Vaoce was a said the Influential Council on he Relations.

No drue hos yet been factors. Police charged and in the ensuing his departura for London by first to go through sult un procedures and confirming the Senate. Yele will be to to find a output there are no obvious from the control of the Frite charges and in the ensuing fray a final-year medical studeut, Francesco Luriusso, was shot dead. Alleged eyewitnessos claim that police ointed deliberately at the students. A musilier of build holes in this wall neurby indicate that they almed at body height and not into the sir.

#### The nurrow, colonnaded streets of the modieval university district toon become the scene of violence Move to lim and destruction os ktudento rioted in anger at the death of their collogue. Small guerrilla graups started renserling and setting fire to slops, breeking windows and amashing cars, e gant shop was raided for manner.

One week after the cod di forum on genetic research, the ernment has declded to all legislation to limir tees

A report hes just beef by the Federel Interagency (C. tee sat up to investigate the tioo, and this recommend lating the use aed produ

The sacretary of the depre

Ho added: "f beliefe mrasure la necessary not

Mr Califend sold h urging research in this hi heltail. He was 'eosuries' ehould proceed under care

# recombinar

weapons.
Two days later, police and carnbinlers with armoured personnel
carriers moved into the university
preclacts and cordoned them off
but skirmlenes continued. Meanwhile, the bittorness had spread to

To e person they were convinced that the shooting had been a deliberate oct to provoke disordet and weeken democrecy in Italy. They regarded it as significant that it had happened in Bologno, for 30 years solidly Communist. There was strong disliusionment et the Communist Party oupport of the Christian Democrats, regarded as corrupt, and its failure to oup-

AMSTERDAM

A 34-year-old unemployed sociologist working as e shiftworker at ona of Hollenti's leaguest clostronics companies was dismissed recently for falling to admit on his application form that he had been to university.

Although an extrema casa, it in

hat full light be thrown on the port their couse. "The Communists have prostituted themselves," said one girl student. "They have lost the square, round the corner some the leadership of the student move-

the square, round the corner sono the lead 4,000 students equatted in the street ment."

## Quota system will stabilize admissions

A quota system with hetween 20 per cent and 70 per cent of first-year places reserved far those applyyear places reserved for mose applying with work experience is to be introduced in Deamark this antumn.

Proposals presented by die Government to the Folketing's education committee also include a 22 per cent intrease in udmission to long-term full degree courses during the next avalence year and the stabilization of admissions of 20,000 mail 1980.

stabilization of administrates of 20,000 until 1980.

The new selection procedures and coorse intake limit follow work by five Govaromeur-appointed faculty committees made up of senior academics and the decision lest June to restrict antry to uli long-term It has been considered necessary

to holt the messive and imagely un-plumed expansion of higher edu-cadoo during the past 16 years. This expansion has seen the proportion of 19-year ofds qualifying far higher 4,000 students equatted in this street chooting slogans, clopping rhyth-initially and raising clenched fists.

The students were perticularly combined to speak of the big demonstration. Moyor Renato Zungherl sold loter that it was largely hecause he did not want to condemn.

The shooting, it was agreed, was on linging students because to nearly three in 10, while university dropouts from degree studies taking between five degree studies taking between five students lave to come and seven years have been estimated by the charaction ministry as high es 70 per cant in humanities and 50 per cent in social sciences.

At the same time innovations, and not be decided annually by Parliament and the Government hus made the course of many over needs in the continuous continuou sher is sold later that it was largely hecause he did not want to condemn the violence, but it was olso enspected that bluer attocks an the Christian Democrats in his speech would have been unacceptable to the Christian Democrat loolers on the platform.

In a sense the Communists had had to make a choice between the Christian Democrats and the students offen and to make a choice between the Christian Democrats and the students offen and the students of the platform.

In a sense the Communists had had to make a choice between the Christian Democrats and the students of the platform.

In a sense the Communists had because the Christian Democrats and the students of the platform.

In a sense the Communists had because the Christian Democrats and the students of the platform.

In a sense the Communists had because the Christian Democrat acceptable to the clear the two centres. Restricted at the two centres. Restricted at the two centres. Restricted at the two centres. Restricted and had to make a choice between the Christian Democrats and the students of the platform.

The demonstrating short-term causes on Roskilde and Aolborg, have had little overall effect on higher education. Only obout 1,000 of last years and because the two centres. Restricted at the two centres. The choice show that there is likely condition. Only of its years and sold in the city of its centres at the

"It was a trap", he said. "But we did not fall into it. The demon-

etration egainst the violence wes the biggest there has ever been in Bologna. It was a great success."

Christian Democrots and the students.

The choice further embittered the students.

The students were demanding the withdrawal of the police from the university preclucts and the reopening of rho university, the rallesse of some 100 students with had been except seath the shooting and the reopening of the university of Bologue's Condition of the following which had been excepted and the reoponing of two small, radio stations which had been closed down on the grounds that they stelled end directed that the shooting and the dismissal of the colly's police chief and provoke disorder and the clty's police chief and provoke disorder and weeken democrecy in Itely.

They was strong dislibusionment.

The students, were demanding the withdrawal of the police from an intending a strong dislibusionment.

The students, were demanding the withdrawal of the police from an intending a system used is now to be epptied for all faculties on the rail faculties of the university of the students were only and citorly others had mere most cellor. The demonstrating students were only an intending and the reoponic density of the forms and the clty's police chief and direction.

On the other side of the continuity of galogue, the theology and volicity fabors were equally on the basis of schoolicaving morks from upper occoundary instituding including the ecadent training and psychology. There will be three only proceeding.

The students, were demanding the withdrawal of the collection of the continuity of the students of school caving morks from upper occoundary institution including the ecadent process (17 per cent), engheners (28 per cent), engheners (38 per cent), engheners (48 p

confield help those who full in get good enough marks to apply directly to university in the first quota.

The 70-20-10 rotly between quotas for the outural sciences and veterinary medicine, for example, perience is to be

stresses direct entry more than the 60-20-20 ratio for humanities and social science. While the 50-40-10 ratio for medicine and demistry puts more weight on work experifuculties, work experience must be indued relevant to future scudies

roining and psychology will adopt a purely points system for entry. Four-fifths of places will be allocated in this way with the remoinder, like for the third quota of the order foculates, being reserved for individual essessment.

Those with nine months' general work expecience will got au extra point and thosa with 15 months or more two puints. These will be doubled if the experience is judged

relevant to future oudies.

There are to be no limits on the intuke of foreign students except

Including mature students, 25 or older.

Except for entry to the technology faculties, work experience will be able to be gained in ony job with points boing ewarded for a minimum nine montho to a moximum 18 months' work.

Points gained will be multiplied by the epplicant's overage leaving mark on the schools one-to-13 grade scale. For nine month's work, points worth 1.09 will be given, rising by 0.01 for every edditional month's work to 1.18 for the moximum. An epplicant with a mark of 7.4 and 15 months' work would thus scora 8.51 points.

Work experience will be considerable growth at newer institution. Odense, the much fevoured technocratic university founded in 1966, will here its intake increased 44.6 per cent, the newes of the two university contros, nt Aorlborg, will get 75 per cent more first-year students and intake at other higher incitations will rise 11.1 per cent.

Republic of Ireland

## Link-up goes ahead for two biggest medical schools

Fraud scandal in Alaska

Higher education in Alacka is in turmoil, the State University has a nulti-million dollar cush deficit, the president has resigned and a stete investigating committee is now trying to find out how the money was spect.

The only private university in the control of the process of the process

Ing to find out how the money was spent.

The only private university in the steto has just decided, efter being closed for a year, thet it will reopen in the autumn; and a netive university in the fer north, has been accused of widesproad freud by claiming steto funds for fictitious students.

The notive Alaskon institution, insulet University, has decided thet it will reopen ofter ell this coming outumn. The compus in Auchorega hos been in deep financial difficulties for severel years. It is the only private to be specified as a specific proper of the severel years. It is the only private to be severel years. It is the only private to be severel years. It is the only private to be specified as a spec severel years. It is the only private university in Alasko, and has been suffaring in the competition for students in the vest but underpopulated state with the fast gruving Stale, University (THES, July 23, 1976).

Last year it dismissed its teachers, transferred its college of nursing to the neighbouring campus of the Stotu University, and set up n

special committee to see whathar there was still a place for private education in Aleoka.

The university came into conflict with its perent budy, the Methodist Church, becouse the church's hoard of higher education. of ligher education was unwilling to invest any more money in the institution, and tros upset that the trustees turned thown an offer by the erete to buy the 300 ocre centus for \$15.5m.

nus for \$15.5m.

Lost summer e special consultethe team wont in Apchorega to see
whether there was e future for
private higher education in Alaska

mant,

DNA research.

recombinent DNA molecults

of heelth, Mr Joseph Cslifer. on releasing the raport: 18 nize that legislation in this would represent en output pased by recombinion DNA niques warrant such a step

sofeguord the public but esoure tha continuation of

Academy of Sciences for that the guidelines should varoelly observed.

guerds understending end banefits posed recombinent DNA to The federal confinitee lation should require any gaging in such research?

while, the bittorness had spread to Rome where a nationwide demonstration of some 50 000 students luned into guerrilla warfare with shooting and more destruction.

On Wednesday, March 16, that only authorities and political parties organized a moss demonstration of shout 100,000 in the main square to coodemn the violence and demand

# When a degree is a handicap

THE TIMES HIGHER EDUCATION SUPPLEMENT 25.3.77

Was killing

deliberate?

of student

search in this vital scendiff a versity.

Last yeer, the Netional is a fit of the less true ther it is become of Heoli Issued guidelines of Heoli Issued guidelines of Heoli Issued guidelines of Heoli Issued guidelines of the less true there it is become regulating any recombinate regulating any recombinate regulating any recombinate armment. Till now there is a blo loba, with the resulting pend armment. Till now there is a some of thom are excepting applied to privete; indeed by the research not sponsored by interest in the some of the many search as the continuation of graduatas to find ethe proposition of graduatas to find ethe pr

澳石工公司



HIGHER EDUCATION SUPPLEMENT New Printing House Square, London WCTX 8EZ, Telephone 01-837 (234)

#### The condition of Oxford

Oxford is much more rhan a university: it is a social institution of great importance in the historical formation—and the present constitution—of the English nation. Through Alice in Wonderland, separated. Oxford (and Cambridge) Through Alice in Wonderland, separated. Oxford (and Cambridge) remained it can even claim to be enthedded in our cultural consciousness. (page 6 and following).

It is taken for granted that a majority of any Cabiney has probably been educated there (and a proposition of the contained on the proposition of the proposition

It is taken for granted that a majority of any Cabiney has prob-ably been educated there (and a

unceremoniously chopped into til or so parts, and Bologue scorred by riots and under virtual martial law.

riots and under virtual martial laty.

Yet the very untiquity of Oxford can lead to confusion. Its medievolorigins may tempt its enemies to regard it as an almost anviguarian institution. In fact Oxford in its present form is very much a une-teenth-century croatinn. Following the defeat of clericolism the university was set on a new course by Jowett and others, to provide the corps of government fur the emerging ludustrial and imperial state as much as in produce academic scholars. So it is not too misleading to regard modorn Oxford us contamporary with the great civic universities of the North and Midlands.

But If the ends were similar, the meane were very different. Tho

moss. (page 6 and following).

It is taken for granted that a majority of any Cabinec that probably been educated there (and a good proportian of the remainder at Cambridgel. No one is surprised rolean—editional many oldsy resent it—that Oxford gradiones are equally well represented in our permanent government, the higher levels of the civil service. Oxford and Cambridge to the civil service. Oxford and Cambridge in the probably service. Oxford and Cambridge in the figure of the civil service. Oxford and Cambridge in the figure in the probably service. Oxford and Cambridge in the figure in the probably service. Oxford and Cambridge in the figure in the probably service. Oxford and Cambridge in the figure in the probably service. Oxford and Cambridge in the figure in the probably service. Oxford and Cambridge in the figure in the probably service. Oxford and Cambridge in the figure in the probably service. Oxford in the probably service in the probably service. Oxford in the probably service in the probably service in the probably service. Oxford in the probably service in the service in the probably service in the pr

particulorly in the humanities. It is also o university that is very concerned to tench undergraduates well. If it is less involved in the bir-in-between "—curricular inno-

deadointe établishment, expressed a more general distribution with the superficial consonier-society glamour of the 1960s.

It was a common complaint of the time that students should become mora reasonable—and henca more realistic—in both their territory.

Radicalism or responsibility?

Why are today's students so boring? is different from that of 1968. The The question is not addressed to students as individuals, but en students—as the costs of education masse; it is not concerned about rise and the value of the students.

LETTERS TO THE EDITOR

unites some chrification.

RICHARD TURTON.

are so equipped.

expectations looms lurge.
Yours faithfully.
P. WOODCOCK.

Paculty of business studies and management, Middlesex/Polyteabnic,/

Principal between in sociology, Hatfield Polytechnic.

Demand for engineers

Sir,—The dean of engineering at of a discussion largely based on Harfield Polytechnic CTHES, March crude international comparisons, 18) provides further evidence that, as Professor Blung has argued, we should regard expressions of "need" in manpower therature with the suspicion usually accorded tradiction in the ale tellon we are the emotive arguments of special interest groups. In this case "lecturers with empty places who are worted about their jobs".

As with all the page 2022.

As with all the panaceas to which British management has been addicted since the Second World War, your correspondent's niece of special pleading is characterized by

This particular expression of subjective belief is fullowed by others, We are informed that "it should be patently alvious that his (the engineering swident's) chances of securing a job in his chosen profession are far higher than for his arts countered." arvs connecepart". Are we in in-derstand that it is patently ob-vious that it ought to be the case that his chances are better, or that arts graduates are less vestricted in their chaire?

in their choice?

It is, apparently, equally abylings to Lord Crowther-Hunt (THES, May 21, 1976) that the majority of 18 year-olds select courses "huggly on the basis of their relevance to particular types of careev". Is there any evidence that students in humanities, arts and social sciences are chousing unwisely in terms of careers, and why, if they are, they should be continuing to do so?

Leaping—with on visible means of support—to his next premise, your currespondent assures us that

your currespondent assures as that from the point of view of resura for investment "there is much to com-mend in backing technology courses". Are we being asked to consider social or private rates of return?

return?
What evidence there is suggests that the social costs of educating

Why are today's students eo boring? The question is not addressed to students as individuals, but concerned about the undoubted seriousness of the issue at the value of the student novement, but the way that they are token up; and it is not asked in a sense of criticism (though many will probably take it as such), but of genuine curvosity.

Student politics has traditionally opersted at two levels. At one level, it articulates the political demands of the student body itself; but it sloperforms a parollel function in symbolizing demands and grivances of a broader social nature. The leaders are not to be leaded to resummer the social costs of education to the social costs of education are the unique are to the social costs of education are the unique are to be lamed for running from ideality. While the work which has been done on rates of return onalysis suggests the fruitfulness of this line of outquive, in the slope of concern, however, se Professor a broader social nature. Toe idealistic revolutionaries of 1968, the manife, in their stracks on the insufficient form that of 1968. The section of the concerned distribution of the social costs of education is and the value of the student body itself; but it sloperforms a parollel function in symbolizing demands and grivances of a broader social nature. Toe idealistic revolutionaries of 1968, the manife, in their stracks on the insufficient form that of 1968. The section of the concerns of the social costs of education is and techning graduate, and as it is an even unique of the student or long and the non-engineering graduates, this assertion of beneficial revolution of the social costs of elucation in the work which has been done on rates of return on only its of the necessary during the processor in the concerns of the concerns of the concerns of the concerns of the concerns o Layard and Sargan suggest higher privote rotes of raturn to lowar cost, part-timo courses. In the context debate. It is, he argued, now essentially protectionist rathar than exponsionist, materialist rather than idealist, defensive of the establishment rather than critical of tradition.

Poly part-timers

Sir,—I om astonished and dismayed by the report you carry (THES, March 4) of Mrs Williams of ottock on polytechnics for their fallure to dayslop adequate port-lime courses.

mora reasonable—and henca more realistic—in both their demands and their tactics.

To o larga axtent this has hap pened but to many observars, tha baby of youthful idealism has been thrown out with the bathwater of "irrespoosibility". Debates within the atudent movement are concerned primarily with means rether than ends. The utopian visions of past student leaders threatan to be swallowed by the bureaucratic effi.

The reoson for this situation is not, as some have argued, that students have become mora "astablishment inded" in a conservativa sense. It is more a reflection on the fact that, just as the social importance of education hos slipped down the agenda of political priorities, so the political importance of the student movement has become increasingly marginal. This polytechnic offers o wide range of part-time courses, from City and Guilds technicians courses, through the degree courses. irresponsibility. Debates within the atudent movement are concerned primarily with means rather than ends. The utopian visions of past student leaders threatan to be swallowed by the bureaucratic efficiency of the administrators of today.

Before student leaders throughout the country leap to their peos in self-defence, it must be reemphasized that this is not a criticism.

The acceptance of the student movement has become increasingly marginal.

The acceptance of the student movement has become increasingly marginal.

The acceptance of the student movement has become increasingly marginal.

The acceptance of the student movement has become increasingly marginal.

The acceptance of the student movement has become increasingly marginal.

The acceptance of the student movement has become increasingly marginal.

The acceptance of the student movement has become increasingly marginal.

The acceptance of the student movement has become increasingly marginal.

The acceptance of the student movement has become increasingly marginal.

The acceptance of the student movement has become increasingly marginal.

The acceptance of the student movement has become increasingly marginal.

The acceptance of the student movement has become increasingly marginal.

The acceptance of the student movement has become increasingly marginal.

The acceptance of the student movement has become increasingly marginal.

The acceptance of the student movement has become increasingly marginal.

The acceptance of the student movement has become increasingly marginal.

The acceptance of the student without exception, our problem hos been to recruit anopagh students to keep the feet of the feet of the student movement has become increasingly marginal.

The acceptance of the student without exception, our problem hos been to recruit anopagh students to keep the feet of the student movement has become increasingly marginal.

The acceptance of the student movement has become increasingly marginal.

The acceptance of the student movement has become i

I shall keep for reletted March 18). There is est graph, however, to white time tutors in the Open to engineering are often broadly based I modetstand that Mr Gray's engineering collengues at Hatfield consider attempts to initiate such courses to have been unsuccessful, while the assertion in the text paragraph that the engineering graduate will be no worse off than Mr Rushl, describing a.

OU and man

Sir. Ernest Rudd's haidu

of one of the three but specifically excluded for awards, mentions the man student who has perhaps a teacher, worked for re-cat much job-satisfacion, "tried, at thue, in a ry planted way, to train for st more to her liking, at her inte 30s or early 40% teenage children are and after themselves is at the intemployed arts graduate re-Unless the representatives of special interest groups inform them-selves of the nature of the problem for which they advocate solutions, those solutions will, if implemented, after themselves, is at the has always wanted at miniversity experiencing the create further problems. Until ther ore aware of the distinction between

ore aware of the distinction between furceasts and projections; the problems and paneity of data faced by those attempting to measure shortages of skilled manpower; and the problems inherent in any attempt to link education and occupational categories, the debate will lack the rigour necessary for the solution of countex social and generate is any He goes on: "For set Open University course. the question. It would raing at their most dense-nany of them badly seet tunity to break out frome gent housewife's feeling de tual isolation, and mit University slees not offer'

in my experience, ad. hose working in a cky th Sir, -- Sir Derman Christopherson's report and the news item on Professor Blang's research "Shortage women the second than of Engineers Meth Exploded" and be the Open Hoisersty of not specify which types of enguoption in question: it weck eer were consently or imminently to be in abundance. So the message ore at school and their ore at school and their at work. I should have the is as convincing as announcing in the spring that train and cenerables will be abundant in the summer. seing a full-time student (where the survey be repor-made) would conflict more demands of domesic file? Indeed it is. Will the harvest be

hig enough is the nume important question. As a healthy balanced diet needs an abundance of trait trute them Imiversity stay
Face-to-fave interials r
introduced in the Open For
but run in the first year? and regerable a sala healthy modern and regerables, on a neurov monoral but not in the new security needs its members adorated student may see her more not wally to literate and monorale student may see her more technological conceivening each week her more reporting each week her property. for themselves once a sect Modern society has a reclinological base which is growing. Suchery needs technological awares the ritizens should necessarily the "feeling of hidder contribute hour of familiarity with entering and most statement to the statement of the s

The "feeling of literacy having every the three Huiversity large all wish more facetofabilities of all kinds hetween studies in her foundation year the many foundation year the second studies and the foundation year the second second studies and the foundation year the second secon engageering and scientific concepts to cope with its gradients. A far too small proportion of our society The main well springs of educaerell-organized, highly departments and school, of cagoricering of the polytechnics and interesting of the part perhaps for the content of courses with the part perhaps for the course of courses with the course with the work of cumacts sale to

Undoubtedly the variaties of man-power plunting will always present the exact match between unfilled MERIVAN COLLS.

nal examiners on a the

London University. The state of the s

Hotfield Palytechnic.

to lack uf students. To put the problem mother way, the cast unjority of our part-time courses could double their numbers without embarrassing the polytechnic in terms of occumorodation, staff and stammers on a tanta and thus relates along interpretates of the problem of the cast involved fit is undertoom to the course of the course of the problem of the p Perhaps Mrs Williams would be institution such as the Perhops Mrs Williams would be performing a more positive task if she wera to inquire why students ito nur present themselves. Whilst we think we know some of the ouswers fand Mr Len Muray touched on some of these) clearly we do not know all of them. In my own experience, lack of know ledge of unulovers' attitudes and expectations looms lurge.

Yours faithfully

turing industry during the next 25 years.

beings and entire human communities have invested their futures,
Outside tha sphere of work and lin-Director, Department of civil state Institute of Depilahame

The British Association FOR THE ADVANCEMENT OF SCIENCE

Published quarterly by The Times Higher Education Supplement in conjunction with The British Association

No 3, March 25, 1977



with the potential hazards of specific new tion, atmospheric pollution, side-effects of new drugs and the implications of computerized record systems for personal

This is not to deny that such hazards exist, nor to dispute the need to reduce them to socially acceptable levels. The point is, rather, that by focusing attention on these issues we are in danger of neglecting more fundamental matters to do with the way technological odvance brings about change in the nature of

humon society.

The question most often posed is whether or not society is willing to accept certain costs, usually stated in terms of risks to health, oafety, individual liberty or the quality of the environment, in exchange for certain benefita from new technology usually otated in economic

The more important question is, given continued technological progress, what kind of society is likely to develop, and what will be the most difficult problems of adjustment of the continue of adjustment as this development takes

We know, from the experience of the past 150 years and the working through of the industrial revalution in many countries, that technology brings about social chaoge in various ways. Through improvements in productivity in agricultura and manufocturing it has played a major part in bringing into being tha affluent

The labour-saving nature of much new technology has resulted in a substantial redeployment of manpower and consequential social upheaval on a grand scale.
This has been most merked in the field of agricultural productivity, bringing about massive decline in agricultural employment in the advanced industrial societies. With the spread of automation, similar declines in employment opportunities are likely to occur in key sectors of manufacturing industry during the next 25 years.

New technologies also result in new systems of organization in the workplace, naw relationships between men and systems of production, and requirements for new skills and abilities. At the same of organizations, production systems and skills—things in which individual human beings and entire human communities.

dustry, technology has made ito impact on the coclol order in a variaty of ways. Developments in transport and commit cntions have increased mobility and greatly reduced the social distanca betwaen human communities. In the domes-tic field women have found freedom from much domestic drudgery and, in consequence, have come to expect much more from life than the kitchen sink.

In medicine improved medical care has contributed to the longevity of the popu-lotion, while birth control improvements have not only produced demographic changes but have contributed to profoun chonges in the sexual mores. Many of these changes have brought human be-ings more leisure time and a wider renge of leisure opportunitias.

of leisure opportunitias.

It can, of course, ba argued that many of the oociol consaquences of technological innovation have detracted from, rather than added to, tha quality of life. The history of the industrial revolution is littered with examples including alienation from work and the destruction of community identity. The point is not, however, that technology produces social consequences of e desirable or undesirable nature, but that it produces social consaquences which are far-reaching and profound, ond about which we know far profound, and about which wa know far

Many commentators who have studied

Ralph Riley: Changing crops that make our society possible—II

David Bache: What makes this Rover 

Howard Steele: Television 1 ORACLE speaks on screen—IV

James Redmond: Television 2: Technicalities of international connexions V

these processes beliave that their lnescapable consequence will be a qualitative shift in the nature of imman socioty—a shift from tha kind of society wa know as "industriolized" to n naw type of society usually reforred to as "post-industriol". The latter is envisaged as nne in which the problems of the distribu-tion of the wealth cranted by technology will take precedenca over problema of

wealth production—hence the alternative description—the "distributive" society.

The principal characteristics of such a The principal chiracteriotics of such a society include an increasingly high proportion of Gross National Product accounted fur by service sector activities. Among the consequences of this trend aro—decline in employment opportunities in monufacturing and a related grawth in employment opportunities in those cervice industries least likely to experience productivity changes as a consequence of productivity changes as a consequence nf tachnological changes as a consequence in medical care, social services, professional and scientific services); and increasing irrelevance of conventional measures of GNP and rates of economic growth due to GNP and rates of economic growth dua to problems in measuring service sector outputs and productivity changes. High rates of economic growth as conventinually decomposed are unlikely.

The "economically setive" will cansitute a smallar proportion of the intal proportion

K. J. Parker and A. J. Vlitos: What do you mean by "sweetness"?---VI

Trevor de Tute and Ismar Glasman: 25 years of textile development---VI

Sydney Jones: How BR got back on the right track---VII'.

BA News: VIII

in the longer term reduction in the labour supply will be achieved by means of injuroved opportunities for higher ond continuing education, by earlier retirement and by work-sharing.

Per capita incomes will be high by current suppliering but their impact on not

rent stondards, but their impoct on pot-tarns of consumption will be moderated by a high level of provision of social benefits for those not in receipt of in-comes from employment and by a more egolitarian incomes distribution. The pressure of high living standards on resources of energy and materials will be moderated by the tendency for high in-come groups to allocate discretionary spending more to the consumption of services than to increased consumption of

Monufacturing industry will choracteriatically be highly automated. In consequence, the average size of on enterprise quence, the average size of on enterprise or production unit, as measured by numbers of employees, will fall aignificantly, giving rise to new forms of work organization. The ratio of direct to indirect workers will continue to decline. The key industries for international economic competitiveness will be those which are ociance- or knowledge-intensive, rather than labour- or capital-intensive.

Barticipative systems of management

Participative systams of managament will develop in all forms of social arganization alongside the devolution of powers and the decentralization of much

decision making.

There will be a move nway from ownership of proporty towards systems provid-ing for use ond access rather than owner-

ahip (e.g. urban pools of mini-cara).
Society will be principally characterized by value systems reflacting concern for the quality of life and for the freedom and self-expression of the individual. The influence of cantral and local government ln oconomic and ancial affairs

will continue to grow. Tha achievement of saxual equality will be accompanied by erosion of tha traditional sociol differences between mala and femule in terms of rolo and

occur sarlous structural unemployment, some of the consequences of continuing of productivity. Like most Utopian viaions it sidestepa tha critically important Isana of how, given the presant condition of industrialized accleties in general — and the United Kingdom in particular—the transition is to be brought abnut.

Jacquea Ellul, in The Technological Society (Jonathan Cape) says, A question no one ever asks when confronted with the scientific wonders of the future. concerns the interim period. Consider, for axample, the problems of automation, which will become acute in a very short time. How, socially, politically, morally and humaniy, shall we continue. to get there? How are the prodigious problems, for example, of unemploymant, to be solvad?

continued un page II



vter(cea).

aimed at introducing the seed

can be introduced through the sail

of previously nuknown species by

brenders. An example af the lang

from the combination—following by:

ization - of the chromosome set d

radish (Raphanus sativus) and Bay

speries such as the cabbage (Mg)

raphanobrassica, are being studied :

considerable promise of success at

producers at the Scottish Plant Res

mentary resistance to discuses into

from each parental species.

Another example of an artificial

thesized crop species is triticale in

combines the chromosome set of

reither bread wheat Triticum aester

macarnni wheat Triticum turgidum of tye (Seenle cereale). Triticul

sembles wheat in plant form and

type but in some environments is rolust and vigorous. It offers they bility of the cultivation of a grant

similar to wheat, in marginal en.

The derived forms, which are of

berry inth coltivation so w

With electronic ignition, it was rela-

tively easy in fit a diagnostic facility foc checking finning and ignition perform-

ance a simple magnetic transducer senses crankshaft position of the front

Again prosting the ideals of maximum

able unit, capable of being fitted into a

variety of models. The up-geared fifth-

roller bearings (identical to those widely

used as wheel bearingst makes this gearlox particularly easy to assemble.

The gear clusters and selectors are all

assembled outper sandwich plate beforehand, and this sub-assembly then slots

straight into the main gearbox cosing. Conventional gearboxes require a large access hole in the rasing to ollow assembly of the selectors in situ—the

crankshaft pulley.

The problems involved in odjusting our social institutions to technological ond economic change are indeed formidahle. Among the tasks we face in the next decade or so are the following:

· Adjustment of the cilucational system to the requirements of new jobs and a new balance between work and leisure. Development of new criteria for meo-

the management and control of public sector organizations and other instintions in the non profit-making field, including educational organizations.

Identification of allequate meens of

 Development of politically occeptable means of transferring incomes from producers to non-producers, and from affluent to less affluent regions.

 The working out of a new system of internotionel Irede, particularly in relo-tion to the developing countries, based on recognition of the absolute requirement to export technology and employment rather than manufactuces.

 Creation of participative managing systems that actually combine effective management with participation.

• Abave all these is the problem of

changing attitudes, porticularly in Britain. If we are to develop adaptive social Institutions so as to respond in rapid technological and economic change and avoid catastrophic breakinwas uf the social order, we must learn how to improve our skills in the fields of planning and social engineering. This will not be easy; if we are to succeed, three conditions must be met.

First, the identification and analysis of the social consequences of technological change must proceed dispassionately, objectively, and as scientifically as possible. Certainly, it must be freed from undue pressuce from pulitical sources or from vested interests or pressure groups of various kluds. There exists an urgent need for the creating of independeat institutions of research capable of

withatmding such pressures.

Second—and this would constitute a major task for such research institutes—there is a requirement for better models

Third, there needs to be an improvement in the way we opproach the actual processes of managing change and conflict. Most attempts to bring about significant change in sneiel institutions give rise to conflict. This reflects the virtually inevitable reactions of defensiveness and resistance to change of those who perceive change—rightly or not—as e threat to existing rights or privileges.

ditions ore tu be met there must occur in the future a claser integration between the disciplines of technology, economics and accillate the past. This integration should begin in the past. This integration should begin at undergraduate level and continue into phase reducate and continue into phase reducate and continue into phase reducate and continue into the reducation of the

programmies. It is a be recognized from the petrochemical industry. The disciplinary reaearch institutions.

It can be argued that it is in the longer rerm interests of institutions in higher education, acting together with industry and government to foster and support the creation of inter-disciplinary programmes of research concerned with the dynamic interaction of technological and economic progress with social factors. Already there is considerable support for such single-diacipline atudies as economic and technological forecasting. The time is now ripe to add a comparable level of effort in social forecasting and to integrate the three into what, after all, has always constituted "the proper study of mankind".

# society possible

### by Ralph Riley

Crop plants provide most of the fond used by man and his domestic animals and much of the fibre, rubber and pharmaceusnrement of national progress towards "quality of life" objectives.

Development of improved systems for life, of human societies would not have ment and expansion, in size oad complexity, of human societies would not have

ably narrow.

Apart from decoratives only alum 500 plant species are cultivated, and the great notivating people to contribute towards societal objectives, given the weakening of treditional incentives.

bulk of the plent resources upon which we rely is provided by some three dozen or so species—the names of many of which will recilily come to mind especially if you are reading this at the breakfast table or over your ofter-lunch coffee.

However, the mere catologniag of the crop species currently used may give an unreolistic impression of flaity and continuity. The range of crops principally used in the 1970s does not correspond to that of the post ond the future may well see further changes-depending upon the pruducts required ond the insight and inventireness of crop scientists.

This is not in suggest that there will be arbstitutions for the major craps, such as rice, whent, maize, sorghum, milleton which civilizations have been builtnevertheless changes may be expected.

The introduction of new crops into agriculture and the disappearance of others is the backelath of history. For example, about 10,000 years ago the first agricultur-alists of the Fertile Crescent of Mesopot-umia made use of, and domesticated, primitive wheat species. The bread wheat speries which is a dominant crup in current world agriculture probably arnse in culti-vatian some 1,500 or sn years later.

For some period afterwards the broad wheat species was cultivated taguther with its primitive relatives but subsequently, because of its greater produclivity and usefulness, it largely replaced them. In addition, its better adaptation to extreme conditions permitted the ex-pansion of agriculture into many con-tinental and sub-trapleal regions as well as into the temperate znnes.

So the primitive species of wheat are nn longer economically significant, but they have not been entirely abandoned from cultivation, as have other income comps. The common British weed Fat Hen (Chenopodium nibum) was formerly a crup. Analysis of the well preserved stomnch conteats of three Iron Age men buried in a ritual manner in Danish peat bogs—has reveuled that their last meals probably consisted of a grucl in which the seeds of Fat Hen figured prominently together with those of flax and books.

e threat to existing rights or privileges.

The constructive resolution of such conflict calls for skills of the highest order, yet the development of such skills is generally neglected. In particular, the almost universel absence of any training in the management of change as part of the formal education of lechnologists is worrying.

minently together with those borley.

In Europe Fat Hen has for long ceased to be a crop but yulnua (Chenopodium quinoa)—o apecles in the same genus as Fat Hen—is still u staple grain in the highlands of Bollvla, Chile, Equador and Pern, us It was for the ancient luces. Little plant breeding work hes heen carried out on quinua but it is a crop which, ried out on quinua but it is a crop which, following research imputs to improve yleld and seed quality, might extend its

effort in social forecasting and to integrate the three into what, after all, has always constituted "the proper study of mankind".

The author is principal of Ashridge Management College, Beikhamsted.

But consideration of rubber cannot end synthetic elastomers, but the petroleum from which it is made is an increasingly costly resource and mureover a resource that is not renewable. So embber, a crop of the twentieth century, may well increase in importance and may indeed need in be supplemented.

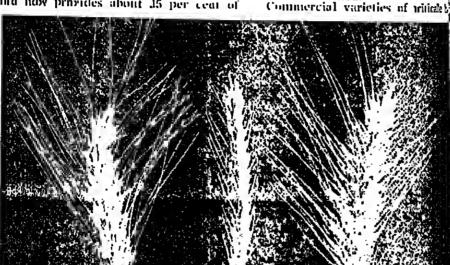
The harvest of mutural rubber could be increased by renewed interest in grayule (Parthenium argentatum-Compusited a language of the decided by the addition of special could be increased by renewed interest in grayule (Parthenium argentatum-Compusited a language). there. Most rubber now used cunsists of

long-lived shrub of the dry areas of North Mexico and South Western USA. It was usach and Sauth Western USA. It was cultivated for rubber production in the USA ht the 1940s when there were no supplies of South East Aslan *Herea* rubber. The whole plant is harvested and about 20 per cent of its dry matter is

The anly guayale naw used is from natural stands in Mexico but with changing economic conditions, and improved pricessing methods and agricultural rechinlagy, it could become a significant crup of the future. Certainly it is reassuring to be able to contemplate renewable stockpiles of rubber being available from such highly contrasted ecological regions as the humid and semi-arid tropics.

Sugar did not become available in Europe until hulk trade opened with South and South East Asia. Before then sweetening had largely depended on honey. The large scale use of sugar awaited the columnitian of the Americas and the establishment of sugar cane (Succharmu officinalis) plantations in the Caribbean,

Sugar beet (Beta rulgaris) is the alter- mouts to which tree would mherwish native crup in came for sugar production been better stified. and now provides about 15 per cent of



Man-unde crop : cereal ears of (left to right) mararuni wheat, rye, and tritial

the world's supply. Until 1801, however, been introduced in Hongary (where when the first heet-processing factory was established at Kunern in Silesda Beta vulgoris was used nuly for cattle fudder or, as beetruot, far culinary pur-

The British naval blockade of Europe prompted a series of decrees by Napulcon in 1811 requiring the study and cultivation of sugar beet. Selection was successfully practised for increased yield and sugar content uf the rnots until in the 170 or so years in which it has been grown as a specialist crop the sugar conent of beet has been increosed from about 6 per cent in the roots pracessed at Kunern to levels in excess of 17 per cent.

Over these 170 years an effective tem-

Sugor has three functions in food preparation but for the first Iwn of these -bulk and texture—there are no olivious replacements. Most of all, however, we hink of sugar as a sweetener and for this purpose several olternatives have been suggested.

Among the most promising of these are the fruits—the so-called screndinity berries—of the central African vine-like plant Dioscoreophyllum cumulnsii. These contain a protein called monellin which has about 1500 since the contain a protein called monellin which contein a protein called monellin which has about 1,500 times the sweetness of cane sugar. Slice it is the carbohydrate nature of sugar that causes problems in the diet of, for example, diubetics, the availability of a protein sweetener would provide considerable advantages.

Investigations are at present under way

Investigations are at present under way sup.

grown on about 15,000 hectarest \$5 and Mexico. The most extensive bases ing programme an it is being undenly at UMMYY (the International feet for Maize and Wheat Improvement).

Mexico where notably beneficial admits bases become have been made in ageonomic that the istics and in yield.

Results su far show that triticale the fit well into highland agriculture is of areas as Ethiopia, Kenya and Medical Work at the Plant Breeding losis Work at the Plant Breeding lates the time decided to retain a conventional Cambridge, reveals that there are the rime decided to retain a conventional cambridge, reveals that there are the rintake and for this new model a low problems to be nyercome in drag profile was evolved.

Strength, in premature germinated the first that in take for engine cooling was the grain and in yielding ability. The air intake for engine cooling was the grain and in yielding ability. The air dam in one large ABS. The bighty engineering agricultured the moulding By moulding this under-nose the bighly pruductive agricultured

he reached as new resources are to and as the inventiveness of plan set lists and icclinulogists reveals aer tialities. Consequently great imput attaches to the conservation of genetic resources both in gar groups already used by mon and instru whose value has not yet been reco

The first steps ere already being cunserre the most important larly welcome that the Cunsultaine for International Agricultural Reservations established, and provided funds an International Board for Plant God Resources. Bur much remains to detail the dynamics of crop details are not so be hindered.

The muther is director, of the hereding. Institute at Cambridge fine.

THE TIMES INGHER EDUCATION SUPPLEMENT 25.3.77

BRITISH ASSOCIATION

## What makes this Rover a front runner

#### by David Bache

High-level engineering has long been associated with the Rover marque; the cars generally having a high degree of originality and thorough attention to detail in their design that made them neculiarly "British-engineered" in character. The new Rover 3500, with its radically different marketing emphasis. Station. In this instance a periodic rantage in the new crop lies in the bination of the different and or might to some eyes appear to be a com-plete break with the engineering tradifions epitomized by the Rover 2000 series, the three-little and the many "14" midels before it. Yet on analysis it cefferts the same spirit of independent engineering thinking, the same response to changing requirements.

When development began the energy crisis was three years into the future, yet already there was a strong feeling that conservation of materials in manufacture, and enuservation of fuel in use wauld be of ever-increasing significance. Likewise, although inflation was yet to suffer the rise which accompanied the Yom Kippur debacle, it was clear that extremely cost-effective design was necessary to enable the new cor to he sold in a similar price bracket to its predaces-

Sors.
Also crucial to the concept of the bodyshell was the requirement for higher rates of production—the car was deliberately aimed at broadening the appeal of the Rover marque, particularly in export territories: current demand is even higher than expected.

Hence the previous base unit "skeleton structure and bolt-on skin panels of the 2000 series car (which design had served its purpose well in a rather different era) was rejected in favour of a carefully designed monocoque structure. This gave more efficient use of sheer steel and thus controlled weight—u vital factor in fuel economy.

In addition, the reduced complexity of the all-welded construction eased the

process of body assembly and its cost. As with most recent Leyland designs, the motor insuronce repair centre at Thutcham were consulted during the body design perind in ensure that the body would be easy to repair after minor acci-

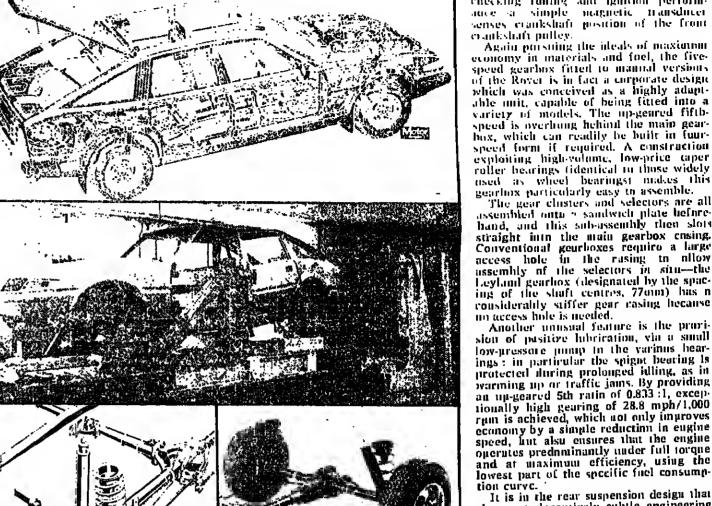
The styling team had a thigh assignment in producing a shape which would fit the Rover image yet at the same time appeal in a much wider range of customers-particularly those with sporting tastes. A bold decision in 1970 was the adoption of the hatchback, semi-estate concept on a middle-class soloon car, when orthodoxy decreed a conventional

The aerodynamic approach to body design, as typitied by Citroen, had lnng been respected by Rover designers (the Rover 2000 would have had a lower nose profile but the cautious management of the time decided to retain a conventional

transverse air dam in one large ABS moulding. By moulding this under nose Clearly wo have not seen the education, it was possible to obtain the pre-clearly wo have not seen the education, it was possible to obtain the pre-tice exploitation of the resources of required for good airflow and crisp plan kingdom by agriculture. It is impearance while, a further major advan-milikely that a stable position will have was the corrosion-proof nature of tage was the corrosion-proof nature of lated impacts before an exomple is finally what is normally a very vulnerable area committed to destruction against a real

glal. Most conventional saloons of simisize have drag coefficients of between 42 and 0.48. The fast back shape, which lits. the fifth door configuration, also Bives stability benefita, with a rearward centre of pressure—an important factor

Impact safety is a major consideration la car body design loday-legal required nents for vacious kinds of impact (bartier pendulum, roll-over cic.] are becom-ing more stringent and widespread every year, so shy new design must be laid down. Willi an eye to the future. The Rover 3500



assisted by the mulytical techniques des-cribed above. For, in safety engineering, there can be no simple approaches—an

over-rigid structure can be more

design and tooling where the computer has made big strides. The Rover bodyshell has gained from considerable experience

gained within Leyland over the past 10

years in the "smouthing" of princi shapes taken from original clay models, and the

digitization of such shapes on to three

dimension recording tapes which can then be used for the production of drawings

ond the mechining of press tool dies. This accurate transfer of complex shapes not

only ensures that the subtleties of style

are carried through into production, but

also helps to improve the quality of hody

that the Rover points out the most

1960s had shown the power benefits of

3 + 7, 2 + 4 and 6 + 8 linked.

It is perhops in its mechanical design

There are other areos in the hody

dnngerous than a weak one.

assemblics.

The Royer 3500. Top-under the skin Middle-controlled ccushing of a bodyshell. Bottom right-rear suspension; and left-detail.

has the classic rigid passenger compart- dummy, which was restrained by a helt, ment with energy absorbent end struc-tures system which is almost universal unusually high level of peotection, greatly

An unusual feoture, which derived from the Leyland ESV cars shown in 1974, is the use of longitudinal compression struts Inside the doors, just below the glass line. These provide a solid lood path on impact via small "proximity" pads located inside the door shut faces and on the door pillars, which contact each other after o

The development of the correct crush choracteristics for optimum energy dissipotion on impact is a fast developing science. Sophisticated computer techniques have eliminated the old practice of using an over-generous safety factor and then using empirical tests. The high cost and time consumption involved in impact testing necessitates a "right first time" approach.

To this end, an early prototype body shell is placed on a crush rig and steadily crushed by hydraulic rains. Because the

rig is controlled it is possible to analyse the deformation process in a way which would be impossible in a normal impact test.

The data obtained from vectous controlled crush tease is suitably adjusted from experience with actual impact tosts, and can then be used in computer similated impacts which will ladicate oreas requiring modification. Hence a bodyshell design may have undergone many simulated in the suitable of the s design may have undergone

of the body.

Early one quarter scale models produced drag coefficients (Cx) as low os coefficients (Cx) as low of at 30 mpb, a Royer some was subjected to this particularly severe test. Not only does ell the energy have to be absorbed by one corner only of the nose structure, but in addition, if the impact is taken on the driver's slde, the collapse characteristics of the steering column are tested to the temperature control (ATC) unit, which of the steering column are tested to the full. To further aggravate the situation, the driver duminy in this test was left intestrained, with no seat belt, of any kind.

On the American standard of Hill on which death is assumed to have a occurred at 1,000 units, the driver registered 286 units, while the passenger e

Leyland gearhox (designated by the spacing of the shaft centres, 770m) has n considerably suffer gear casing because un access hole is needed. Another unusual feature is the provision of pasitive lubrication, via a small

love-pressure pump in the various hearings: in particular the spignt bearing is protected during prolonged idling, as in symming up or traffic jams. By providing an up-geared 5th ratio of 0.833:1, excepnionally high genring of 28.8 mph/1,000 rum is achieved, which not only improve economy by a simple reduction in engine speed, but alsu ensures that the engine operates prednminantly under full torque and at maximum efficiency, using the lowest part of the specific fuel consump-

It is in the rear suspension design that the must deceptively subtle engineering thinking and development have taken place. It was an exceptionally bold step to commit the design team to the ochievement of high standards of ride and refinement with a live year age on a car of this ment with a live rear axle on a car of this type and price. By going back to first principles, a very original and rigorous design solution was worked out, which in fact is patented by the company.

A live axle has obvious advantages in terms of significant descriptions and company.

terms of simplicity, durability and cost, lint while guod handling is relatively easy to achieve with careful location ond damping, what is difficult is the combination of all these factors with good rida

tion of all these factors with gnod rida and vibration isolation.

A major factor in the success of the design is the provision of generous fore and aft compliance without empromising lateral location. This is done by allowing the front cross-member, which chrries the location brucket for the nose of the torque-tube" type differential housing, in swing on its mountings quite freely. However, virtually no lateral movement is ollowed, and in conjunction with the rear Watt linkage, the axle is very prerear Watt linkage, the axle is very precisely controlled to climinate any significant "bump steer" effects.

Also important to the standard of comfort is the provision of large apring travel fort is the provision of large apring travel (23cm) with constant rate springs. With a large hatchback snloon of considerable load-carrying capacity (up to 550kg), the use of low-rate springs for a soft ride could hove led to sagging problems but these were avoided at relatively low cost ond without any manufacturing or service complexities, by using Boge salf-levelling damper units, which make use of the very suspension energy which they significant engineering trends, particuof the very suspension energy which they have to dissipote anyway to maintain the car near to normal ride holght, regardless

These completely self-contained dampers were very carefully located in the lines inining the wheel centres and the torque tube nose pivot, thus both bounce and roll modes of suspension movement would be equally controlled.

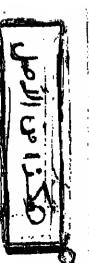
phasing the outlet pipes to give an extractor effect; this principle was used on the new exhaust manifolds, which have dual bullets each aide with cylinders 1 + 5. Implicit in this apparently simple sus-Implicit in this apparently simple suspension design was the requirement for a low floor-level to maximize the stowage area and also a safety location for the fuel tank, which is entirely ahead of the axie and pornly beneath the rear sect, well away from impact deformation zones.

The torque tune principle assists with space saving since the arc of awing is 3 + 7, 2 + 4 and 6 + 8 linked.

In order to achieve the legally required control on exhaust emissions, the latest version of this engine is fifted with SU HIF typa corbupettors, which have automotic fuel tamperature viscosity compensation, while the air intake is temperature controlled by the award willing air requestance control. (ATC) with which

space saving, since the arc of awing is more compact than with a normal prop-shaft and live axle—and in addition, the geometry of such a layout gives anti-squat properties under acceleration torque irproperties under acceleration to que in put, and ronversely, intidive torque inder hraking, both pasful properties from high-powered cur like the Royer.

temperature control (AIC) unil, which uses a vecy simple blanctallic strip filermostat device lo mix hor air from an exhaust manifold "oven " and cool whillielle air. A hear-constant intake ultremperature is important when using the lean dir hiel htts/drey necessitated by pollution regulations, and also assists fuel The author is director of stuling in the product engineering division of Leutand



Television 1

## ORACLE of change speaks on the screen

### by Howard Steele

increasingly chary of accepting at face special "decoding" equipment would volue the claims made for the role of become available from industry in sufnew technology in the classroom and else-ficient quantities to provide a realistic where. In view of some claims made in assessment of the experimental services the 1960s this is understandable—but it before they were the to conclude in does pose problems when it is no longer. September 1976, a question of crying "trolf" or engaging in "futurology" but of considering a in "futurology" but of considering a hoppen and it has only been very recently major extension to broadcasting techniques that can be demonstrated here and now, and is already being transmitted duily as a pilot service.

modest engineering research project show is hoped that not only will the news and real promise of giving the public some-information services have been more reol promise of giving the public some-thing completely new—a broadcasting facility that provides not sound, not television, but a means of broadcasting the programme-linked and public-service written word and simple images in alumdance, and largely free of the constraints investigation will be made into the ques- tors "which recreate the original messagenf programone schedules : for such is rele-text—or ORACLE as it is called by Inde-self-supporting (or partially so) by means pendent Television and CEEFAX by the BBC. No other country has yet established a comparable service—though several are on the economics of the system. working towards this end.

Teletext, it is already clear, can provide interactive system "Viewdata" will have useful extension to broadcasting for the been field-tested using about 1,000 a useful extension to broadcasting for the public at lorge-with the emphasis on receivers, and a decision made on the news and information. But equally interesting, if still in an embryonic stage, are the possibilities it upons for sociallyvaluable services including optional cup-incurs additional costs in the user city links or distribution facilities, through its use of the telephone system.

For the brondeaster a telefact service hard-of-hearing and the provision of pro- it is confidently expected that Viewdata can be established for a modest notifice.

gramme-related material for education and instruction.

BRITISH ASSOCIATION

ORACLE and CEEFAX were first the IBA and IIBC. Independently deveproviding similar services. By the autumn of the fullowing year a joint technical specification, drawing on the mriginal ideas of both systems but with are split up into many short gaps. increased capacity, had been agreed in A very small part of this "wasted" roughnerion with the British television time—just two "lines" teach 6]-

by the IIBC and the IIIA in September 1974 (with the independent television programme companies assuming responsibility for the ITV transmissions in 1975).

Tu receot years educationists have become

Perhaps too aptimistically, the broad-time the picture is traced on on your casters had anticipated that the necessary screen, a burst of high-spread Morse is

For a variety of reasons this did not in very limited quantities and at considerable cost.

Not very often—perhaps only nace in several decades—does what began as a extended until July 1979 by which time it fully developed but also there will have been time in explare in more depth the aspects of teletest-and for ITV further than for electronic "character genera-

And by 1979, the related Past Office Viewdata provides mure pages more quickly than the brondenst systems but

receivers will be equally suitable for ORACLE and CEEFAX reception.

Brnadeust teletext exploits the demonstrated in the spring of 1973 by "wasted" time of a conventional television transmission—the blank periods laned they differed technically though hetween the individual pictures. Alto-

idustry.

Experimental services were initiated television "field" are sufficient, with undern rechnology, to provide a means of transmitting bursts of very high speed data signals.

It is all rather as though after every sent, but at speeds vastly in excess of anything ever contemplated by the pioneers of relegraphy. Whoreas a manual telegraphist achieves perhaps 20-30 words per minute, transmitting continumsly, the teletest information goes and at an overage of around 50,000 words per minute, and the armal transmission rate during the "librat" of plata is far higher than this. If the height of a television picture is reduced, the data can be seen as twinkling does on two "spare" lines at the top of the pirture.

At the receiving end the incoming data hursts are separated from the normal television picture signals and then any single "page" of information can be selected and fed into an electronic memory. This in turn provides informafor simple still pictures) for display on the screen. In effect it is a marriage of televising and computer technologies with "telecommunications" acting as best man.

This ability to " piggy-back " (TRACLE) information on an existing television transmission is one of the main attracreceivers, and a decision made on the tions of the system to the broadcast engin-start of an official Past Office service. eer. He needs no additional transmitting statioos, requires up more of the precious

ORIGINA

Above : An example of the lie formation that would be sale tIRACLE. Right: how it wall, to the riewer at home.

(by television standards) on h: the equipment and rompus to set up the data signals a: studio or regional centre and tional costs in ensuring that mitter network will not degrade ing hurses of data.

His main costs are for the"; the collecting, editing and sent information. These account less part of providing a teletext & obspend, for example, on the limits each day during which i and information pages are kept and of course the scape of these,

Any means of hrnadeasting its word has special appeal to he'the hard-of-hearing. It is he's some 21 million people comers, general category in the blueder above : to the United States, some ling. But of rourse such viewers more if material is directly relate ionnal relesision programmes of optional raptioning; that is betioning arross the lower ping picture which dues not appears the screens unless required.

As a cesidt of experiments @ by the ITV companies, a special for this has been incorporated;

parity between the two. The ex-Instade ast side by side in the same would place a high premium 64\* and trouble (rev standards cons

The two early French system ning standard appropriate to their but the plun in Britain was to ila: samie programme co hoh 20 llence we needed to have the of the standards with means for mg to the other for the bonefit d whose receivers worked only of

By 1963, BBC englucering ilepartment had developed electrimic standards canvorter a complete departure from trunsfer or "aprical" system

The fell of the standard with the free property of the propert

transmitted schools programme.

Then, of course, the raptioning facility is of porticular laterest to classes for regional news; theatre and exhibition hard-of-hearing children—and there guide; shapping prices; specialist inforseems a possibility of using overlay test mattern pages. to odant schools programioes in lawer age groups or for remedial education. Again, the public teletext news and informotion service would clearly be useful in

motion service would clearly be useful in schools for extending the owareness and interest of children in current affairs.

The future scope of teletext is inevitably a question of numbers of users, and this in turn will be afferted by and will itself offert the rost of the additional decoding circuitry needed in the rereceivers, or to adapt existing receivers.

The winds rosts of propagational publish Broadrasting Service, on techniques which might considerably reduce the cost of providing captioning; fur example by The rising rosts of ronventional publish-To probe educational applications a limited on order of experiments have been attractive. carried out on ORACLE, although the

It is perlings still too seldom apprecivirtual ooo-availability of teletext de-coders in schoola has inhihitad this work. the development of micro-cirroits has ated outside of engineering rirrles that For example a teletext "multipage"— tipped the balance firmly towards far that is, a page bearing a specific page greater use of electroolc communication number but with the contents changing techniques. As Professor W. Gosling has

put it recently "the age of silicon" opens, appearance on the screen). the way to connecedentedly cheap trace-

BRITISH ASSOCIATION

-is of the order of handreds of pounds; though, even so, within the reach of those with a professional or sent-professional need for a capid service of financial or

The cost of developing the special micro-circuits is amboubtedly high-stwo component firms are already reported to an words or simple graphics arractive and be investing close to f.Im in this project. easily directed. But once this development work has been paid for, there is every reason to suppose that the cost of decoders will fall perhaps dramatically, as we saw happen

with electronic calculators.

For a relatively modest capital outlay or weekly reural, the viewer will have access to a teletext service of news and beight characters" which will considerably at fairly frequent intervals beight characters which will considerably aid the viewer in reading the changing captions.

antoniutically at fairly frequent intervals information: continuous time checks, moves flashes and headlines, financial and intervals intervals intervals are checked intervals. stock exclunge news and prices; sporting news and latest odds; television and radia programme information; local and

Of rairse, not every viewer will seek such services to begin with-but us the price advantage over printed material becomes increosingly marked there is only the news and information which he every reason to believe that telefect will or she wants—the rest can be ignored, prove not an engineering toy but an Using telefect is thus more akin to skimimportant element in electronic ming through a newspaper, schoolog the publishing.

provide? Earh "page" can contain up report may have been compiled only a m 960 charocters or roughly 150-200 few orientess ago.

words. A "magazine" consists of op to There is still ouch to be learnt on the still ouch to be still ouch to be learnt on the still ouch to be still ouch 100 pages—and the system at present periods on to eight magozines, or 800 system: British engineers throught up pages, to be transmitted. With the care and developed the system and indicated rent use of jost two data lines per tele-vision field, a full transmission of 800 pages at the rate of approximately four pages per serood would require just over three minutes; ood this would result in an unwieldy "arcess time" (the interval between selecting a poge number and its

The TICA experience suggests that up musion of information by electronics; to 319 pages (arranged so that the more teletext is an important aspect of this frequently used pages are transmitted advance. But the provide an acceptable At present the cost of decoderss-either balance between overall capacity and built into receivers or as separate adaptions for use with conventional receivers two channels, limits each CEEFAX transtwo claimtels, limits each CEEFAX trans nursium to 100 pages.

With 200 pages one may easily have 50,000 words—the length of a short novel—available. Additional information can be carried on "multi-pages". Many techniques are being developed to make the editorial presentation of this information

To exploit the new possibilities fully the type of information carried on such a service should be extremely "time conconscious" with continuous editorial upduring at the computer terminal. If this is done the user has an un-to-the minute service, constantly at his disposal. An advertiser could reach his market

quicker by teletext than by any other meous. On the other hand long-life information is still more sensibly conveyed in newspapers, baoks and maga-

It is sometimes rlaimed that the amblence is already saturated with radin and television news and that yet another system is unnecessory. This view ignores the different nature of teletext to news hullerin. With teletext the oser selects orbidishing.

headlines but reading to details only
llow much information can teletext some reports. But golike a occuspance the

> in broad autlice how it could be used Now it is up to others—the programme people, the new breed of teletext tournalists—to write io the details.

> The mathor is director of engineering for the Independent Broadcasting Anthority.

Television 2

## Into Europe without wobble

### by James Redmond

Television crossed the sea for the first time in 1951, when o team of BBC engineers took one of their early 405-line black-and-white television outside broadcast units to Calala ood viewers in aouthero England were able to see "live" io their owo lionies scenes that were usuelly only associated with overseas iravel. The television signals were beamed by radio link back arross the Chaooel to a receiving point ocor Folkestone and thence in two hops to London,

In the 26 years that heve elapsed, international television has become commonplace and the whole world oow expects to be able to participate by television whenever an event of international intereat takes place anywhere on earth or

were currently using two different stanwards; 441 lines and the very ambitions

819-line system, side by side.

Par those countries which had started television after the 625-line standard had would merely require the provision of suitable international lioks but the prabletts of programme exchange between enquiries using different television stan-

dards limi still to be solved.

Various workers had written theoretical papers on this subject, suggesting that convarsion might be achieved by so obvious a proceeding us televising the nicture oo the original stundard and viewing the display with another camoro working oo the new standard. The principle of "image transfer" standards rooversion, os this come to be railed, is very shople but the achievement of entiring shople but the achievement of sutisfartory results presented severe technical

The fuodamental difficulty is that, although o television picture may appear to be continuously present on the screen, it is made up of only one single very anull bright spot trayelling at a speed in excess of 7,000 to lies as hour to write in the 405, 625 or 819 lines in one-twenty-fifth of a second and they have a second and they have in the fifth of a second and then begin all over again. Persistence of vision in the humao for that matter in space. The standard standard the stand

Britain the BBC was using the 405 line thay would otherwise impact to the telesystem with which it started televisino vision picturu a must undignified sole-limadensting in 1936; while the French ways withle.

Alas, the French public electricity sup-ply was not synchronized with ours and hen an overload of the autional grad on either side of the Channel caused general corried confrely different pro-tors to slow a little, there might be as which could be originated on the been adapted, exchange of programme material from the technical point of view would merely require the programme would merely require the point of view in the nominal office images can difference in the nominal office images. in the nominal fifty images per second. However, the first operational converter was installed by the BBC with the triendly cooperation of French television on a hilltup at Cassel in France, Inland from Calals and about 40 miles from Daver.

was uriginoted in Puris and broadcast in England. During 1953, a concerted effort by a large number of European countries brought into being the Eurovision network for loternotional programme exclusing ond the BBC installed upperotanent standards coverter at Tolernot 1011 the united and the coverage of the coverage o In July 1952 a series of transmissions urds cooverter at Tolsfard Hill, the British teriologi of the cross-Chunnel links. This converter was designed to handle incoming alguals from either of the two main continued European standards, i.e. the transfer or "aptical" system 625-line atternational standard or the 819-

International exchange of programmes soon became a familiar feature of television in Europe although there was, of couras, no means for intercontinental exchange the means to means for intercontinental exchange the means the m coursa, no meons for intorcontineous exchange: sea path's could be exceed the most thet could be achieved by single-hop television links and for must practical purposes this is still limited to something less than 100 miles.

digital form back into an analogue signal the American NTSC rolour telavisino to be broadcast on the old-fashioned 405- transmissions received by satellite ioe networks.

ing captions.

The hundensters have had to be care-

ful not to raise the hopes of the bard-of-

hearing too high. There is at present un

regular transmission of teletext caption-

ing, and it is reenguized that the cost of

preparing captions in terms of man-hours

per programme-hour is at present appreciable. The cost of decoders is also still

Much interest has been aroused by

and, in the United States, by the Poblic

using the Palantype court reporting system, possibly with phonetic spelling of

work at the University of Southampton

In 1962 a new requirement entered the orbit of the television engineer. Transatlantic live television became a possibillty with the launchlog of telecommuni-cotions satellites. We not only had the problem of the oumbers of lines in each complete image scao—the Americans use 525—but because their public electricity supply operates at 60 Hertz lostead of 50 Hertz, as in Europe, they have ten more television field scans per second.

The techniques developed for use io the standards converter from 625 lines to 405 lines could be extended to deal with differences in field scan rates as well. It will be obvious that for every picture elament of the incoming pictura here must be some momeot would be appropriate to use its loforma-tion to the essembly of a picture scanned on an entirely different television standard.

The techoloue is again to sample the incoming signal, store each element until it is required and then pass the signal into the output. The period for which each element has to be stored varies according to the position which it must occupy in the scanning rester of the new system and upon the relative (god unsynchronized) timloga between the two scanning resters. Tha technique is again to sample the Every element thus requires a dif-

of atorage but this can be prodicted given knowledge of the rolative positions and timings. The field relative positions and timings. The field store standards coovarter operates by directing the incoming signal elements in through electro-acoustic paths which delay their emergeoce until the opproduct of the priate lostant. A biararchy of delays with high-speed directing switches performs what occ of its inventors called a Cassack Dance" to carry out the switching logic at very high speed and with precision. The delay paths are polygonal blocks of quartz, carefully tamperature-controlled, in which the signals are caused to echo around until their exit is due. their exit is due.

The first all electronic field-store standards. Converted was demonstrated its August 1967 and an advanced version and a standards converted where a camera tube is arranged to plew the lungs. The quitor is director of engineering, Games from Mexico City ion October A sample standards converter where a camera tube is arranged to plew the lungs. The quitor is director of engineering, Games from Mexico City ion October A sample standards converter where a camera tube is arranged to plew the lungs. The quitor is director of engineering, 1962. 1968, projucing colour pictures on the on a cathodo an tube ecreen

the revised signal is turned from Its 625-line PAL standard for Europe from across the Atlantic. More than 300 million viewers throughout Europe saw the pictures it produred.

As the compounication satellite facilities have grown to the point where pirtures may be originated almost any where, the ability to convert not only from one schming standard to another hut also from one colour system to another has been an essential factor in the world-wide coverage of events of international interest.

The rapid development of digital terhniques applicable to television, with the new-found ability to carry out switching

pendent Brondrastiog Authority and first went into service in November 1972. This apparatus is olso in regular service and performs the extremely complicated digital processes upon the signals that have been derived from sampling and

coding the incooling onalogue television signals. When it has rearranged the infororatioo io such a fortit that ao image portrayed in the iocoming signal is now at a trayed in the tocoming sigital is now at a new line-sconning steodard and on a new field repetition rate, the signals are theo reconstituted into configure form for transmission as though they had been originated by the television camera on that particular standard. Transcoding between the different systems of colour, NTSC, PAL or SECAM, is carried out at the same time and by the same device.

and sompling of analogue signals at rates producing pulsas counted in many megabits per second, clearly damonstrated the need to develop a digital field converter as a corollary to the digital line converter. played. The expert watches for minor improve the supervisor of the superv ers which have proved so successful in the operation of the television service duplicated on 405 lines. Such a field converter was developed by angineers of the Inde-

THE ME

CAMP AND

SUNCHAR DI COM

original scaooing process; it is displayed after conversion at different discrete intervals dirtuted by the scanning standard in which the pictures have been converted, and the perfection of inter-polotion regulared for satisfactory pur-troyal of footion is very hord to achieve. Modern convertars are olmost perfect.

In spite of standerds converters and sntellites, the international exchange of television programmes is still very much restricted by the problems of copyright, and language and time differences. Even in Europe, where the technical standards are often the same ood time differences. ore small, exchanges ere, lo the main, restricted to programmes auch as the Eurovision Song Contest and Jenx sons  $oldsymbol{F}$ rontières.

Language is not o problam to North Laoguage is not o problam to North Alocrica; but copyright and time differences, coupled with the problems of acheduling, hove ensured that most entertainment programmes are still exchanged on film—a truly international standard. For similar reasons, the big obproductions for world-wide distribution, such as Age of Uncertainty, America, and The Ascent of Man, also use film.

Man, also use film.

But the combination of standards convarters and satellites is a powerful oce; atandards converters parmit programota exclange on any television standard and satellites permit immediacy. That use of both provides complete fierbillty,

"both provides complete fiexbully,
"As a result; It is possible for the world
"to be there" during great evects such
as the Olympic Games; and to receive
oewa reports as quickly and as detoiled
as lo the couotry of origin. Wara, and
the methods of conducting them, are oo
longer private affaira and the effect of
worldwide and immediate reporting on
public opinion can be considerable. Tha comprehansive reporting of the Victoria words a good example

The world is now a very small placa fir communication terms and we are much better informed because of it. The modern viewer; however, tends to take it all for gracied and complains a little if tha subtle colourlogs in an event taking place on the other side of the world ere to the slightest degree lass perfect than thosa from a local studio. It was a BBC engineer who, on the occasion of man's first landing on the moop logged the pictors quality was to baing of somewhet, substanded the moop with the moop with the substantial transfer of th



acids and can be construed to include

explain the lack of sweetness of the sugar

raffinuse or to extend the concept to syccieuers such as Dulciu (N-p-ethoxy-phenylurea), while remaining within acceptable limits of credibility. It is cer-

tainly of no value in predicting sweetness

in numerous compounds which are no

since the AH-B criterion can be identified

It is probably true that a closely defined disposition of volunizable functional

groups may he a prerequisite to exciting

the sweetness response. It is also con-

ceded that no one ospect of the molecule

is the sole determinant of this quality. Such factors as hydrolinouhilic bulance, woter solubility, ionization, molecular weight, molecular shope, and energy and

the simulus and the intensity of perceived

If there are several types of receptor

site involved, each with its choracteristic

template pattern, then sweet substances

may be grunned into molecular types, each of which provides an identical sweet

stimulus, the intensity of which depends

Such a mechanism would explain the

phenomena of taste persistence, initial

A complex molecule such as the pro-

These hypotheses represent a gradually

increasing understanding of the malecular

mechanism of taste stimulation.

sivcemess.

## BRITISH ASSOCIATION SOCIETY CONTROL OF THE STATE OF THE S

## What do you mean by 'sweetness'?

## by K. J. Parker and A. J. Vlitos

While everyone would claim to know what is meant by sweetness, it is far from easy to arrive at a precise description. The percention of taste is an individual experience which does not readily lend itself to exact measurement. Without either no objective definition of the property of sweetness or means of quantifying its intensity the search for a valid relationship between sweetness and the chemical structure of a substance evoking the sensation is likely to remain unfruit-

Nevertheless, interest in this difficult but challenging subject remains un-daunted, spurred on by the demands of dicticions, physicians and soft-drink manufacturers for en acceptable harmless non-carbohydrate sweetener.

So far oll known sweet substances have been discovered accidentally, there being logical studies on paimals, though It no certain guide from the chemical structure. ture that a compound will be sweet. The ence is exoctly parallel to that of a test diversity of substances which are sweet animol. ranges from such simple compounds us chloroform, salts of the metals beryllium and lead, through sugars end aminuocids to sulphonamides (which include saccherin and cyclamates), complex terpenoids and proteins. Thore eppears to be no property or molecular feeture common to all these substances which alone could be linked to sweetness.

The intensity and quality of sweetness does vary widely, the sweetest known substance being the protein, thannatin, the sweetness of which, composed with a receptor sites on the surface of su-called just detectably sweet solution of sucrose,

In such a comparison the characteristic cant differences, though these are not easily described. For example, the mance of sweetness of glucose can be described as flat and barsh, of fractose

perception of sweetness is not o unique course, selected to ultain close unistimulus but there may be a spectrum formity of taste perception. of sweet responses. To understand liny this might arise it is necessary to consider the more general merhanism of taste as currently understood.

The psychophysical approach to taste perception, which is cancerned with the conscious impression of taste, differentiates four primary stimuli; sweet, bitter, salty and sour. All tastes are regarded as combinations of these four primary tastes, though, of course, the total flavour impression also includes tactile (for example, "month-feel") and ulfactory

The opposite school of thought classifies thates os phints in a "multi-dimensinnal space continuum". This approach is less rigid and provides a simple means by which different perceptual attributes of flavour—for example, astringent, metallic, phenolic—can also be represented. Such a model is supported by

progress has been made in understanding the mechanism by which the sensation of taste is conveyed to the brain. Tho tongue and polote are involved in gustatory perception, which is readily distinguishable from olfoction, or the sense of an overall appreciation of

receptor sites on the surface of su-called not sweet, while \$\theta\_{-D}\$-mannuse, a sugar, tastebuds which are grouped into this is actually litter. The delicate dependent

approaches 100,000. Sugar ur, mure speci-fically, sucrose, traditionally becomes the stundard with which other streeteners are which transmits the stimulus as an elec-by galactusucrose which is trical discharge to the brain, which can he detected and related to specific recepflavour of other sweeteners show signifi-tors. By this means it can be shown that individual receptors are very seasitive to specific stimuli, of which the four primary taste quolities can be distinguished.

There is evidence to suggest that different recepturs respond more strongly thin and fruity, of xylltul cool, of saccha-rin bitter and of the protein monellin to specific sweet molecules and that liquorice-like, thungh such impressions these differences are genetically controlled. This is seen as variations in The variotion in the quality of sweet- individual taste impressions and in the ness observed between sweeteners and observed spread of assessments among between individuals suggests that the members of a taste panel, which is, of

Although it is convenient to represent taste sensation os a compusite of four primary stimult, analogous to the three primare colour standards of the visible spectrum in colour vision, there is little cridence in support of the analogous physiological mechonism.

Consequently, in seeking a relationship between sweetness and chemical structure, it is not necessary to accept the premise of a unique all-embracing mulecular stimulis, though it would be satisfying to find this. Several receptor types. ill of which transmit a signal interpreted as sweet, could coexist, each being rest prhereus their micror-image Lenantee pousive to a particular molecular pattern

Early attempts to relate chemical structure to sweetness ottributed to certuin molecular functions the property of exciting a sweet respanse. These overe terned "glucophures" by analoge with direct experimental evidence from physia- the corresponding functional groups in coloured substances, termed cheamo-planes, which physorh light strengle thereby imparting coluur, by the same annlogy it was proposed that secondary During the past 35 years considerable functional groups, corresponding to the auxochromes in light absorption, termed 'auxoglucs", are also necessary for the development of a sweet stimulus

For example, the hydraxyl function alone does not clicit sweetness-alcahol is not sweet-but addithund hydrnxyl smell, though the two senses logether groups are associated with increasing sweetness, os in the sorles—glycol, gly-cerol, xylital. But there are many exceptions to this simplistic approach: Hyrotoquereltal with five llydroxyl groups is

unly difference from sucrose being the hydroxyl group at position for places and of the plane of the glucostic.

Professor Robert Shallenberger also York State University has advanced most comprehensive hypothesis of the mulecular basis of sweetness so k though further modification has in proved necessary to encompass a mirange of sweet compounds.

According to his possulate the gal cular structural criterion of sweet. can be represented by a dual (more the All . . . B system. A oud B are, electronegative atoms, with o spaids pastition such that the A-II proton and distance is almost exactly 0.3 mm. h. conjectured that this is complement be a similar configuration of atoms, the receptur, such that hydrogen be are established between the receptur? entropy of odsorption at the receptor, will eock have its effect in determining both sweetener, resulting in a redistribute; electric charge and triggering & nerve impulse.

The importance of a precise fither the sweetener and the receptor is an sized by comparing compounds dille only in the spatial disposition of it functional groups. Amino ocids de natural D-series frequently taste at are tasteless or bitter.

On the other hand, the series di carbon sugars, known as hexore, delay in perception, competitive and sweet in both the L and D-forms he synergistic sweetness. not necessarily equally sweet. The A complex molecule such as the pro-explained by the dual character of tein, thanmatin (composed of 198 amino hydroxyl group which can function is acid residues) shows a distinct delay of us a proton donor (All) or proton a about a second hefore the sweetness tur (B). Hydroxyl groups are there, develops which then persists after the changeable, and the molecule cantil tosting is finished. Certain substances a conformation having the necessary reduce the after-taste, possibly by themposition of groups.

Amino acids do not have the stanmatin molecule involved in general numerical are the AH (NH) with the sweet exciting points, or are the AH (NH) with the sweet exciting points. On the It (COO) groups interchangeable is other hand, it the sweetness site is asset in asked, as by a polynomic neith, then it importance of this freedom is set masked, as by a polynomic neith, then it is no longer found to be sweet. other hand, if the sweetness site is itself such undecolarly constrained compact as sucruse or the inositule; an estr. hydraxyl group structurally out of the ment cumot be corrected by any at able molecular contuction and sweets is lost, as with galatosucrote

Dr K. J. Parker is general manager and Professor A. J. Plitus is chief executive mynlausital. of group research and development for This proposed merhanism and admirably to sample sugars and to Tate & Lide Limited.

> washing, dry-cleaning, light and rubbing on both dyed and printed faliries. All these needs have been met-and

more. A fairly recent technological breakthrough has been the technique of With every chemical finish price printing complicated designs or even larly for gorneuts worn next to their plemes directly on in a finished garthe pussible health hazard is someth, ment, by means of "hot pressing" a

All of these systems are almed the conglication of the development, has filling certain needs increasingly expect the establishment and commercial by the enstoner for easy-care same exploitation of this latest aspect of washed by suphisticated domestic exploitation of this latest aspect of ing atachines which have eliminated columnation technology. During this development the back-breaking washests for British designers and colourists has the recognition and the necessity for blanch the superior and colourists has the present the wall as the necessity for blanch the superior and colourists has played a considerable port. Renctire

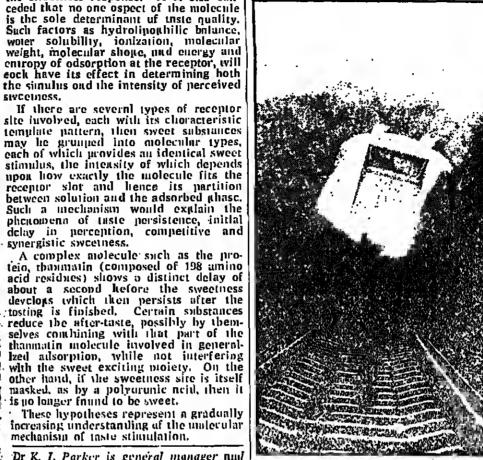
Despite the many adventages of the effects have been dyed or printed; the effects have to be assessed. We thetic filtres multined above, their soft colour physics to quality control in such a spoid and despeed these areas. existence alone could not have these areas, where previously the subsuch a rapid and widespread indetivity of the humon eye was the sole Without their efficient conversion in the control of the humon eye was the sole without their efficient conversion in the conversion of the humon eye was the sole without their efficient conversion in the conversion of the humon eye was the sole without their efficient conversion of the humon eye was the sole without their efficient conversion of the humon eye was the sole without their efficient conversion.

desurement techniques, utilizing a spritish built colourimeter and computer software. We believe this approach will chave alguificont ramifications, not only in process and quality control of fabrics, but also he minimizing gorment rejects polymer structures and the actence of fibre structures and the appropriate knitting machinery depends in the early 1940s in this country in the early 1940s in

## sweet substances such as chloroform, heryllium salts and kenzyl nlcohol. Hotyever, it kecomes difficult, for example, to back on the right track

### by Sydney Jones

BRITISH ASSOCIATION



Experimental advanced passenger train at 125 mgh with 8 per cent tilt rounding a curve.

The essentially fragmented approach to garment-making pre-war steadily gave way to more organized factory units. The large man-made (libre manufacturers realized the need to become more involved in stimulating consumer demand if the medical realization are set in motion and the manufacturers and the realization are set in motion by the realization are set in motion and the realiza

stores. The pruliferation of new fibres and fabrics, whose performance characteristics were still being improved, developed the need in retailers, piontered by Marks and Species to amples tech hy Marks and Spencer, to employ tech-nulogists in order to relate the functional

scale market testing of new products, whose quick results were as important for the fibre producers as they were to the retailer. Consequently some fibre produretailer. Collsequently some fibre producers began integrating downstream into fabric and garment production while at the same time forging closer direct links with technologists in retail companies. These closer relationships, if applied properly, could result in a faster, more professional approach to the economic, technologists to the economic, technology and closed-loop stability criteria), and houldness with large computing facili-

Without a doubt these multidisciplinary Without a doubt these multidisciplinary technological developments have enabled that textile industry to fulfil the consumers' needs for increasing quantities of fashlonable yet extremely functional clothing at prices which, everyone can afford.

Les and modern instrumentation.

The work, which was recognized with a McRobert Award in 1976, stimulated thinking about the optimum design of the bogies for the High Spaed Train and to the concept of the Advanced Passenger. afford.

Modern science has tended to find its economy of design concept, for extions on a substantial scale, due in part to occupied on straight track; ong term lack of competition.

But when competition becomes explicit and threatening the response can someimes be dramatic. The case of road versus rail oetworks is a case in point. It resulted in the railways rising to the speeds economically.

About 15 years ago the British Transorr Commission decided to build a lurge port Commission decided to mind a large research laboratury, costing over £1m, as the first step in developing a competitive technology. The present research laboratory of British Rail is now one of the best-equipped and best-staffed of its kind in the world

In the early days it sought to identify urgent problems, and the highest princip was given in an examination of the dynaspeeds at an ecunumic rate.

Railways throughout the world had been subject to competitive pressure for the jobs that are difficult to fill, many decades, but no satisfactory solution A further development is the fato this problem had been found, primarily because of a fundomental problem that and long been recognized, namely instrbility. At relatively low speeds, rail relatives (ollowed the track smouthly; but us the speed increased, n point was reached at which, however smooth the track, the rehicle would break into an uncontrollable lateral oscillation, initially harely perceptible but becoming quite pronounced us the speed increased,

Essentially the phenomenon is dynamic instability of the kind arising in any guid-ance mechanism that employs a feedback system of control. In railways, guidance is provided by coming the treads of railway wheels, so that a pair of wheels fixed solidly to a common axle will follow u curre in the track by moving laterally butil the effective diameters of the wheels on the two rails are sufficiently different.

When the pair of wheels meets a disturbance on the rail it will oscillate luterally with a motion that, in a nonconservative system, may be expected to diminish as an exponentially decaying trave motion, with a wavelength along the track depending only on the coning angle

if they were to make efficient use of their the rails; and as the speed and fre-hulk production units. the rails; and as the speed and fre-At the same time retailers, themselves in the origination of the development, has taken a leading more influence on the device.

At the same time retailers, themselves important, the amplitude of the lateral ing to exert more influence on the device.

The problem, so simple to describe but performance of garments and textiles to the properties of these new fibres.

It became clear that retail stores such as, ours twere an ideal vehicle for large-scale market testing of new products. suspension aystems capeble of stable speeds up to 300 kilometres an hour ond yunning, in an aconomic ninnner, at beyond.
This success could not have bean

nical and aesthetic aspects of production. and equipped with large computing facilities and modern instrumentotion.

However, the consumer, who usually benefits most from technology is becoming increasingly influenced by the worldwida "ecological backlash" against it. How well it reconciles technology and the consumer will remain one of the main challenges, for the textile industry in futura.

Train (APT).

The High Speed Train represents the modern railway engineering practice which is based on a new bogia permitting trsin, speeds of up to 125 mph (200 kph) to be echieved where track curvature is sufficiently gentle. The Advenced Passenger Train increases performance still further in a number of important respects for it allows: Train (APT). The High Speed Train represents the

readiest market outlets in the sophist ample in the use of one hogic per coach ticated "science-based" industries such and the articulation of coaches in such as aeronautics and electronics; it is cum- a manner that on a curve above is miniparatively rore in see industrial applica- mum encroachment unuside the volume

4年、71.0年代,中国国国国营

•low aerodynamic drag ond lightweight construction to reduce fuel consumntion : low unspring moss to reduce pounding forces on the track;

Onowerful braking to match the speed; It is hoped that the phased introduc-tion of these two trains into public use competition in a vigorous manner and solving one of its formerly major problems—the inability to reach competitive will meet future demand for high-speed rail travel up to the end of the present century. It is no exaggeration to say that for the first time in their history, railways are now able largely to satisfy the demand for comfortable high speed

ground transport in an economic manner. In addition to making trains run smoother, faster and more economically, other senects of improvements in system performance are being pursued, nombly signalling, on which the fullest use of the track heavily depends. Already the "twomic interaction between wheel and rail, aspect "(stop go) semaphore signals have as it was evident that predominant among the various technical problems inhibiting the commercial development of railways two levels of caution, go), and the manual was the inhibition. was the inability to reach competitive nonventure of signals and points is rapidly giving way in remote electrical control with the considerable saving of mattrac-

> A further development is the fact that the location and state of readiness of a vast fleet of freight wagons—information essential to efficient manegement—is now controlled through a data communications network coupled to a data store. And the " slab track ", a form of railway construction in which the rails rest on a continnous slab of reinforced concrete or other suitable material, is in an advanced state of pleveloument.

> One question that often nrises is whether these developments are too lute in the bistory of rail transport. One has only to compare the convenience and relutive luxury of the modern motor car with the relative incurrentence and similar of much train travel to have considerable doubts about the future of rail.

If the trends in forms of transport of the last few decades foreshadow the the last lety occades forestation the developments of the future, then one con hold out little hope for o general rail passenger—and hence freight—network. There are however, three very important factors which bear on the future pattern of course when hear on the future pattern

of events, namely:

the technical developments already achieved put railways in a good competitive position and provide a springhoard for further fature developments:

commy of fuel and uniterials of construction will become development.

struction will become dominout consider

tions in the near future;
growing resentment of pollution of all orms, noxious exhaust fumos, noise and visual intrusion, are becoming evident.

These considerations, taken together, lead to the belief that public rall transport will find more favour in the future than recent events would tend to indicate, Perlisps the greotest obstacle to such a change might be the failure of decision-makers fully to appreciate the changing opportunities becoming evailable; together with the sheer momentum of current events and thair own limited logic of self-destruction: "More cers, more roads; more roads, more cara."

Once this present trend is checked, a cumulative movement in e more desirable direction could quickly be established. As reliways are a fixed-track system with considerable investment in the track, they are 'said to be "volusie-hungry"—in other words the investment in the trock can only be justified if it is naed by sufficient ravanue-aarning treffic.
Unit costs will therefore diminish, with

t increese in tra freight as well os passenger traffic will be encouraged to use the system. Further technical improvements, for example in signolling investment to improve track traffic-hondling capacity, will also be stlmulated.

Such e beneficiel change from a decaying to a growth industry con, however, only proceed to a limited degree, on the convenience of the private car will not be readily chandoned. The fullest develop-ment of ground transport in the future therefore requires not only a roed/rail freight system (on which some work is being done) but the proper integration of the convenience of the private cer with the economy of cell. This will require a radical reconsideration of the respectiva rolas of thesa two motles of trensport()

The author was until recently bened member of British Railways for research and engineering:

# 25 years of development in textiles

## by Trevor de Tute and Ismar Glasman

There is no doubt that technical developmenta which heve taken place over the pest 25 years in the UK textile industry have hed a considerable social and economic impact on the consumer, not just in industry generally, but particularly in clothing, household textiles and in the leisure field.

In the lete 1940e the natural fibres—cotton, woel, flax, jute end silk—dominated, Man-mede fibres et that time were almost ientirely, rearricted to regenerated.

The growing range of years and Cupramical interesting to restrict the restriction of the chemical structure as the structure of the property of the chemical structure as the structure of the chemical structure as the chemical struct knowledge of the chemical structure of

viscose rayon was superior to cotton for innovative technology of the people mude them unique for parachute fabrics. Consumer requirements.
Even then developments in the acience and technology of textiles were seen to be

one of the keys to future prosperity. As already mentioned, the bulk of fibres in use at the end of the tvar were based upon natural raw minerials which were in short supply and, heing imported, were not easy to ecquire. The emergence of nylou on to the textile scene in the lete 1940s was followed rapidly by polyester, a totally British discovery. In the 1950s we saw the emergence of acrylics and polypropylene fibres with polyure thanes (elastomerics) following in the

Not only did these new fibres produce novel fabrics in their own right, but they were also suitable for blending with

natural fibres. Initially, these fibres were only ovallable in continuous filament form, but technology soon introduced a number of modifications which greotly enhanced their eppeal. Weys were found to produce cut fibre versions so that they could he spun into staple yerns thereby emuloting natural fibres more closely.

There are many examples which one could quote where fibre or yarn modifi-However, the doveloping science of X-ray crystallography was helping to establish links between chein building polymer structures and the science of texturized nylon filament variations.

reinforcing synthetic rubber tyres and involved, where fibre science and fabric nylon filament yarns had properties that technology were allied to fushim and

In oddition to the above technical achievements an important factor in the rnald success of synthetics was also their relative price stability, at least until the end of 1973, when world all prices, on which most synthetic filtres depend fur their raw material, were rapidly in-creased. Although prices in the early days were higher than for natural filines, reflecting the initial high cost of research, development, manufacturing plant, marketing and sales, their price stability allowed a greater confidence in long-term planning production and sales commit-ments. Such stability is much more difficult to schieve with notural ray materials, depending as they do upon the vagaries of farming, agriculture and the

Interestingly, the special characteris-tics of fabrics available from these new yarns-warmth with lightness, shrink resistence, drip-dry and crease resistance as well as hard-weering properties -- sour exposed the limitations of natural fibres, particularly their lock of eosy-care chararteristics. In their fight to remain com-petitive, in which they have been essenti-ally successful, crease resistant chemical finishes end shrink resist mechanical treetments were applied to cotton and ayon; permanent press finishes became housahold requirement on cotton ond polyester/cotton fabrics. Fibres based on cellulose, cotton and royous, as well as some synthetic fibres, for example ecrylics, are not inherently flame returd-

Therefore we have seen over the last 25 years a determined effort by fibre producers, helped by chemical munufac-

resin finishes. These clastomers refe ing further outlets, especially in 1001: fibres, whose performance properties nuch improced.

the pussible health hazard is someth; for which the scientist must now use part of his overall assessment.

All of these systems are almed and teryear, as well as the necessity for

Usually it takes 25 years or more is bound to the fibre, were novel developfundamental discovery to reach is scale industrial application. In the fibre, were novel developfundamental discovery to reach is scale industrial application. In the fibre, were novel developments of British origin in the late 1950s and of considerable impact in terms of brightness and fastness.

In the field of water ond energy conservation, dyestoff manufacturers and, barticularly machinery builders have in the figure had riscn to 39 per can the last few years made a significant which nylon held a large share, phenomenal growth has continued for dyelng mochines which use low-liquor or less malasted, an that by 1950 and of considerable port. Renctive dyestoffs, which can be chemically bound to the fibre, were novel developments of British origin in the late 1950s and of considerable impact in terms of brightness and fastness.

In the field of water ond energy conservation, dyestoff manufacturers and barticularly machinery builders have in the last few years made a significant contribution with the ever-increasing use of dyelng mochines which use low-liquor or less malasted, an that by 1950 and of considerable port. Renctive dyestoffs, which can be chemically bound to the fibre, were novel developments of British origin in the late 1950s and of considerable impact in terms of brightness and fastness.

In the field of water ond energy conservation, dyestoff manufacturers and barticularly machinery builders have in the last few years made a significant contribution with the ever-increasing use of dyelng mochines which use low-liquor or less malasted, an that by 1950 and 1950

Without their efficient converted with the converted woven or knitted fabrics to which the filips, shade nentching and accepto-woven or knitted fabrics to which the filips, shade nentching and accepto-fluishing and printing imparts in particular Merks and Spencer is indesired technical and aesthetic fluishing the forefront of developments to introparameters, as well os improved the forefront of developments to introparameters, as well os improved the forefront of developments to introparameters, as well os improved the forefront of developments to introparameters, as well os improved the forefront of developments to introparameters, as well os improved the forefront of developments to introance properties, their impact wook been greatly diluted.

Each new fibre, starting with Be

## Pride of presidents

To attempt to pick out all the highlights of the forthcoming British Association Annual Meeting et Aston would he not ouly invidious out also impossible. Out of a programme of over 300 pepers, symposio, special and public lectures, however, it should not prove difficult to flud many which will command interest. And among these, certainly, will be the presidential oddresses.

For those not already familiar with the way in which the BA urganizes its annual meeting, and general lusiness throughout the year, it should be explained that for the sake of convenience and also partly as a result of historical development, the sciences are divided into 17 "sections". There are those who argue that 17 is a lurge and unwialdly unmber, end others who say that the divisions are not sufficiently fine and would like to see the number

Sometimes e section chooses a theme to run through all its papers, for example, section L (education) this year, will speok on "improving the quality of education", while section I (economics) is devoted to "the economics of devolution". Sometimes sections combine to present an interdisciplinary symposium, of which two of Aston will be on 'ageing" and "cancer".

Each section is heeded by o president, a scientist distinguished in his or her own field and whose presidential address at the annual meeting is regarded by many as one of the most important statements of the year in thet particular branch of

Section A & A\*/mathentalles and physics: Professor Harold Hopkins, FRS, professor of opplied physics, University of Roading. " Optics in clinical medicine" -an occount of the invention of fibre optics and new types of lens systems and their influence on clinical practice, and n review of same of the possible applications of the laser in endoscopy.

Section B/chemistry: Professor Charles Kemball, FRS, professor of chemistry, University of Edinburgh. "How do bring about chemical changes?". A review of thu evidence goined in recent years about the nature and reoctivity of odsorbed intermediates and their importance for understanding the mechanism of catslytic processes. Scellon C/geology: Professor M. R. House, University of Hull, "Evolution Observed". The diverse revolutionary pattorns of fossil emmonites over 300 million years enable o deteiled timescole to be established which is used for internetional correlation of rocks.

Section D/zoology: Professor P. C. C. Garnhom FRS: emeritua professor of medical protozoology, Imperial College of Science and Technology. "The continuing importance of field work in zoology", nr, evoid the corridors of power and the chromium-plated laboratory; instead meke your observotions under the natural canditions of the forest, steppe or desert. Section E/geography: Professor Kerl Sinnhuber, professor of geogrophy et the under way?
University of Vienna. "Recreation in a ... And as the 139th president, Sir Andrew

Rieuse and me further information about the Annual Meeting at Aston as soon as it becomes available. am particularly interested in .

Attending the whole Group visits
Scientific lecture

programme
Scientific and
industrial visits

Careers events
D. Young people'a events BA ANNUAL MEBTING 1977, University of Arton, Freepost\*, Birmingham B4, \*No stamp raquired.

NAME

is the environment espelile of absorbing extended to ather HAYS Branches. a further increose of recreational uses without detrimental effects?

Section P/economics: Professor E. T. Nevin, professor of economics, University College, Swansea. "The economics of Paper of November, 1975 proposition the proposed assemblies for Wales and Scotland will be able to exert a very marked effect of the economic environ-Section G/engineering: Sir Frederick Worner, pro-chancellor of the Open University. "The environment for engineers"—why are engineers faced with a hostility when the recard of improvements in all directions is evident?

Section H/onthropology: Dr M. R. A. Chance, department of ethology at the University of Birminghum. "The social structure of attention and the operation of intelligence". A social structure of attention with a group has recently been discovered revealing an unsuspected

bimodality in mental structures. Section I/binmedicol sciences: Dr T. Vickers, senior principal scientific officer, Research Progrommes Division, Medical Research Council. "Science and Safety". Recently developed techniques of genetic engineering offer enormous potential for medical and agricultural application, yet there may be serious hazards. The present state of the debate will be assessed, Section J/psycholugy: Professor A. Sum-

merfield, professor of psychilingy, University of London, "Behavioural Toxicity the psychology of pollution", a discussion of the adverse usychological effects of chemicals absurbed into the body.

Section K/hotany: Professor J. G. Hawkes, University of Birmingham, "Genetic Cunservation—a world problem". To help combint famine and malautrition, plant breeders must be continuolly trying to incorporate genes for higher yields, helter quality and greater disease appropriate and app resistence in their new varieties. The spread of standard varieties and the intraduction of modern farming techniques is destroying onclent geoetic resources and genetic conservationists are seeking ways cullecting and storing them for

Section K\*/forestry: Professor L. Roche, eportment of forustry and wood science, olversity College of North Wules. forestry and the Community". British farestry in relation to major sacioeconomic treinls within the nation and future world timber supplies.

Section L/ethicotion: Mr A. Yates, director, Notional Poundation for Educational Research in England and Walos." Improv-ing the quality of Education", the role f research in educational change will be examined in the light of current policies

Section M/ogriculture : Prnfessor K. J. A. Bleasdole, director, National Vegetable Research Station, Wellesbourne, "Britain's Green Revolution", on approisal how modorn technology is being used horticulture, mainly in vegetable pro-

Section N/sociology: Professor N. Elias. University of Leicester: "A question of time". An ottempt to throw light on the relationship between the physical and sociel sciences by examining the relotionship between physical and social time.

Section X/general: Sir Douglas Black, chief scientist, Department of Health and Social Security: "Research ond Welfere ". What are the requirements of o. lorge government depertment concerned with welfare, and whot are the problems in actually getting the relevant research

Huxley FRS, Royal Society research pro-fessor at the University of London, will BA: Annual Meeting August 31-September 6, Science By Buildence, clues and motive in

#### BAYS environment

Two interesting new projects have been added to those undertaken by BAYS. Age Concern and the BA brings together (Brilish Association Young Scientists), organisers of volonteer groups in daily members in different parts of the coon-

Corroelon of metols

The British Steel Corporetion hes involved three BAYS Branches (Sussex, Crawley and West Wiltshire In the first Aktoo, Freepost\*, Birmingham B4.

\*No slamp raquired.

NAME

Aboress

for their location, However, in addition the regard them.

being asked to comment on research. Teske and Teams to providing data, BAYS membars are regard them.

to providing data, BAYS membars are regard them.

being asked to comment on research. Teske and Teams

Association for the Advancement of the Market of the Harrogate Control of the Harroga

mountain environment". To what extent can be made and the survey possibly The objective is to study the inter-

related effects of the frequency of wetting and drying of expased metal and the deposition of atmospheric contamination. Sets of specimens will be sprayed devolution", which examines the White with distilled water and the rates of corrision compared with other specimens exposed to the elements. Some will be sprayed with diluted salt sulution containing known amounts of sulphate and chluride to compare them to those exposed only to atmuspheric contamin-

Sail fauno la ploying fields

tu November 1976 n ime-day DAYS conference at Rothamstell Experimental Sintion provided an opportunity for members from nine branches to hear something of the work of the station and in discuss HAYS involvement in callahorative projects. In the event, it was not pussible to invulve members directly in current work and so the final session was devoted to discussing projects of interest to Rothamsted which HAYS might initiate. It was agreed to begin a study of soil funn in schunl playing fields. The Rothumsted scientists nuted that there was little data in this area and BAYS could perhaps make a unique con-

Its purpose is to investigate the relaliouship between the age of a piece of grussland ond soil fanna. This will proide opportunities for students to map the location of playing fields in any area and to delve into their history,

The BAYS environment project has thereforo progressed to a new stage where members are themselves making practical suggestions for scientific study. Since this is the last year of the current grant from the Goldsmith's Company we are now seeking further sources of finance to commune and expand studies.

#### Science fairs

Since his first event- in Manchester in 1961 there have been 84 science and technology fairs held at Pl different

Lard Bowlen, writing about the one held in Salford in 1975, looked forward in the work going on in schools and onl-leges "in the bellef that scheme and technology ore matters of great fascion-tion and that the work of the true scientist is as warming in the senses as that of the trno urtist "."

Only one foir committee has in the past cuncentrated solely un technology (the "Tamorrow's Technologist" series of fairs in Newcastle upon Tynel hat every falr contoins a varying proportion of technology exhibits. With the current concern about the luck of effective com-munication and llaison between inclustry and education, BA fairs have still much to contribute to increasing the nwareness of young people in the significance of technology for our future,

This year hos produced an impressive programme of felrs which starts with Judley from Morch 21-25 and is followed y Worcester April 1-5, Halifax June 29-uly 1, Salford July 4-8, Oxford July 8-12, Canterbury July 12-15, Aston August 31. September 7 (ot the Annual Meeting).

Finelly, our Northern Ireland branch is this year to include in its juttler BA meeling, for the first time, a science and technology fair. This will he in late September on dotes still

# PERSPECTIVES

A thousend people concerned with the elderly will be meeting in Harrogate, no November 1-3 for e three-day conference celled "Age Perspectives '77":

organisers of volonteer groups in daily contect with old people, and the doctors, scientists end administrators on whom they have to call for information and reacurces. They will have the opportunity, not only to correct their views of aach, other, but, also to question the writers, journalists and broadcasters who mirror the alderly in their work and thereby described with their work and

cern Scurland, sees the oced to the the perspectives of each party age cal next stage in the work, Will million people over retirement by them, ranging frum the state list local committee of volunteers, name for an exchange of ideas. Many d teams at work have a very una

The way we see each other in times is always churded ood today images from an earlier era. To hege public heside every conteioporar, le scientist stands his Hollywood equal preen smake pouring from his last and beside every worker in the t tary insvenient stands the gloss of larly of the minor, distributing by sour in case her cunscience,

first how fur the contemporary are nre from such a model is shown be form and content of the Harrogae ference. A nurvement of the size of Cuncern, with 1,000 local comm preganized in 15th regional, com metrupolitan groups, needs to ber not only by the goul hearted, but? the well-informed.

Within the next five yeers, one! in five will be over retirement age. partium which means that the elde translated from a "them" to an' And the movement that caters in has to calculate the dimensions rask. If voluntary workers are going officiently, they must hear regular, clearly from the specialists.

New Light on Old Subjects

In 1975 the first discussions tol on the creation of an Age Actions eyas accorded to encourage those at: carring for the oblambit wos he that many specialised hodies (9 the topic of age was not cental) heing their specialised talents to noun the subject of ageing and throw new light upon it.

The BA responded to this this hy holding a public nuc-day sympun ageing under the chairmaoshipa Tessor Walter Hollmer, FRS, who ng the group of people who can the BA committee on social concent biological advance.\* Meetings of study group continue throughoutes

But theoretical acodemic paper one thing and practical work as the work of voluntrers in incal and can seem remote, if not irrelevan Tessur Sir Perguson Amlerson, who self has a foot in each world by p sair of perintric medicine at the W sity of Glasgow and also, actively of of the vice-presidents of Age Co-says: "The ductors ond scientists knur what conditions in the contra are like; and the field workers must access to the Intest knowledge advice. The laboratory of the fulue in the community—that is where we going to get information to help? people into ald age."

Care and Commerce A third group is involved to the ing tugether of Ideas and altipoted ing tugether of Ideas and altipoted in the ingression in the ingressi lurger commercial and employers. Company pension and misschentes can be considerate end efficient and can form part of the vast and supporting the retired, olong with provinced by the state, the local and

and the volunteer agencles. Mr I). G. Hosegood, UK pension ager of lluilever Ltd, explains his pany's policy. Arising from the the transfer pensions for its 22,000 sioners, his department becomes b point for queries, odvice and help the retired: from this evol Unilever l'ensioners Associetien provides a link for old friends to the litterest oud a genuine back-up for for those requiring help 6 health, income tax, pensions and the authorized to the association is largely a selful.

ron by volunteers (themselves pentsioners), but odministered t tered at the centre. There are similar schemes runia other big organizations bot ther out thing in cummon, their last their retired workers es people " Densioners ".

\* Copy of the full report of th ceedings is available at £2 post for the Symposium Secretary. The Association for the Advencement ence, 23 Savile Row, London Wil

Coming back to British university life after fire years away, one's first impression is that the atmosphere is even more depressed than one had expected. Here, as in many other parts of the world, the 1960s saw unite unparalleled growth in university provision. In cost places the climate has more changed; with us, it has changed in the more paralleled.

In most places the climate has more changed; with us, it has changed int the more because our economic crisis is particularly secere.

Yet, crisis or not, the economy could not have sustained the 60s rate of growth in this sector for much longer. Growth, yes, but not at that pace; that was a sport to cotch up where we were well behind. By any reasonable international comports on the British universities have had very good special treatment, and they are not being asked to destroy themselves now.

thentselves now.

In that heady period from the Rubhins Report to the end of the 60s, the British universities grosped some of their new opportunities suprectely well. Above all, they did not buy rapid expansion at the cost of their new opportunities suprectely well. that almost unique feature, small-group

undergradume teaching.
They could hardly inford one-to-one or even one-to-two tinorials; but small seminar groups could still be managed, even in the arts departments whose high student: staff ratius reflected the staff-intensive character of the advanced science departments. Hurdly a university settled for that mass teaching which treat on increasingly in many other

Nor was wastage high. In the late 608 a Nor was wastage high. In the late fills a French university professor—o devoted teacher as well as a fine international scholar—told me he simply had to rely an huge wastage after the first year so that later years could have lecture groups of less than a comple of hundred or so; seminars were out of the question. He wanted to teach well those he finally saw through the degree course and to look especially well after his postgraduates. What the bacculanceor results pushed into his university in one year he saw going out—about 40 per cent af them, at aw going out-about 40 per cent of them, at

casi---the next. In contrast, the British style is typified by the remark of one vice-chancellor—I think it was Eric James—that, since we look such care in selecting for relatission and put soch stress on what used to be called "pastoral care", it should be a fair assumption that virtually

everyone got through in the end.
On the whole thin assumption worked. In
the full flood of expansion, some students
obviously came in who did not quite know what they manted to do with themselves, who had let themselves slide plung through O levels onto A levels to university entrance, and were then out of their element. But they were a minority, as no doubt were those characters in Evelyn Wough's early novels who slid along from Eton to Oxford with on available purpose either.

on explicit purpose either.

Overall, there was justification and to share for more university places; talent was being wasted on a considerable scale through lack of opportunity; expansion was well

lack of opportunity; expension was rell overdue and most pointle who now got their chance gained from it, as has saclety.

Another French professor told me that our greatest problem was not students but staff—the dilution of stoff quality by overapld growth. Undoubtedly there are some people now teaching in universities who were amplituded in the 60s and who would not even be short-listed today. But the fact that we were able to expend so fast, and keep the general level of staffing so high, is the most striking single evidence that we had been striking single evidence that we had been wijficially costraining much very good

The clahurate and rould Robbins exercise, with all that it meant in new stuffing recrulingent of students, touching and residential hulldings, nod in all the other manifold details, was carried out by the teachers themselves, backed by ioralizent but not numerous—nor always technically-trained—administrative officers.

It is easy to underestimate the nature of such an achievement, It was inspired by the British acodemics' natural wish not to hand themselves over to "an administration", to neople who do not teach, who may never have (aught, but who have powers to order and direct the teachers, and who no some foreign compuses ronk above "the fuculty". One had to go on doing things oneself.

The cost in time and energy was immensoly high, sometimes too high, The law of "any more for the undertaker" overstes hera as elsewhere and energy was appeared to the undertaker of the source solors.

elsewhere; thosa who will, may. Some sentor academics could not serve usefully on, say, a hulldings committee no matter how hard they tried; some others—though they may be as competent as the next man—would not he willing to serve; they value their time for research too with the do your are simply search too much disinclined.

More and more the vice-clioncellor and deans therefore know to whom they can turn for conscientions committee work. I do not mean power-seekers or neople hoping even-tually to become vice-cliancellurs; I mean people who, though they may not have become internationally famous in their disciplines, had contributed substantially to them, and could have added two or three more volumble books to their scholarly ochlevemants, but who wanted their universities to lake proper advertige of exception and had take proper advantage of expansion and had

lake proper advantage of expansion and had a particularly strong senae of communal duty. People such as these served for many hours a week on university and faculty committees right through the 60s. The further books were nut written, but the expansion went through in a very human end reasonable way; and that one must suppose, is their monoment. They were the loyal servants of their universities as cornerate bodies, and every university has several of them.



# The uses of education

Richard Hoggart describes his impressions of recent changes in British higher education on returning after a five-year absence

It is, however, a pity that here as elsewhere we did not think about the problem rather more. But that is the kind of whinking we to not do very well. We will shoulder, or let other people shoulder, greatly increased medens of an accustomed kind; we are much less ready to neak out solutions to such prac-

Of coorse, there were and ore exceptions The new universities were invited to think rudleadly and some did. Gulhenkinn and the Universities Quarterly organized a success of annual conferences on the apportunities before universities; and there are other in-stances. But all in all, not enough was done to assess the different kinds of opportunity may offered.

I have in mind two majo orons. First, thinking about the physical and social contexts of the new universities concentrated too narrow-ly no unc form. That model resulted in the manning right across the country of the new Haedeker establishments, each set in Its two hundred or so acres with its substantial resi-

Agreed, the model has many virtues. Its residential provision and its assumptions about pustorial care are among the most geogrous in the world, its great disadvantage, as a notional model is its one-sidedness; it lacks variety and inventiveness, in both its social and educational thinking.

Why did no one insist on establishing an innercity day-student university? Not primarily for cherpnoss, but because that kind of invitation also has much which is disting live to offer to students, and to the ucigli houring community. It would be very interesting to know—if only os an example of how certain sociol models become dominont—just how the 200 acre, residential-park dream became so persuasive to university planners in the 60s.

University attlitudes have not always been like this. In the oinetanoth century first Oxinidge, and later London University and so the rest, hegan making provision for the community outside their wolls. The achievements of university adult education, insolved their works of the control of t by neonle who were fine scholars and teo cher; as well as deeply concerned are today insufficiently racognized within nost universities themselves.

Too often in the last dacade or so, to think about the universities' relations to society was to think chiefly of possible grants from industo think chiefly of possible grants from the in-cry or from government agancies. These may be important and volumble, but they are not the heart of the matter. So, between those who wished only to pursue their specialisms and those who saw their links with society in terms of grant-intended work within pre-determined parameters, o great opportunity went largely by default.

Nor was enough made—at lenst in the arts and humanities—of the opportunities expansion provided for rethinklon either "subjects" or methods of teaching. Little was heard of the value of and need for more part time evening degree courses. They would have litted perfectly into a non-residential city university; they could fit well. Into most universities of any shape or size.

Naturally, there was much thinking about syllobuses in the new universities (less about "subjects" except, notably, or Sussex1 and there was some dovement in older places; but relatively little in comparison with the opportunities. To their credit most people accepted the case for exponsion, even those who would themselves thore preferred to remain small. But they too often say expansion as a matter of simple growth of existing forms and specialisms.

One professor of English (in a new universtry surprisingly) remarked, a prepos a pusistry surprisingly remarked, a prepose a pust-graduate centre in contemporary cultural studies which I was setting up width the English department at Dicollegiam during the early 60s, that he really did not see him-self becoming involved with that kind of thing. After all, he soid, one needs the full three years to introduce students to "the

His confidence was unassailed. For bim, apparently, there was a "subject" as clearly demarated us the multiplication table (if that sail is clearly definable), rather than a contingently-prescribed, historically-defined, ortificially-fixed grouping we call "literary

" English" is my own "cubject", so I feel all the more strongly about the opportunities most departments missed. Over 70 or 80 years, English literary study in the universities has developed great strengths. It has also been over-circumscribed in both defini ion and purposes. It has too much isolated literature from other disciplines which could inform understooding of its social and personal contexts and so of "the text itself".

It has too much prosecuted literary scholar-ship in and for itself, seeking—no matter hav much numbers and needs locreased—, hing much numbers and needs locreased—
above all to train the next generation of university and grammar school teachars of
English. As a resulf, its attampts to make
historical or social commaxians were usually
insufficiantly Considered applique work.
The 60s, must of whose greatly increased
numbers of students would not become
university or grammar school teachers—and
certainly should not hove been encouraged
too narrowly in that direction—provided un
ideal opportunity for looking at the whole
subject afresh. In general, those opportunity ideal opportunity for looking at the whole subject afresh. In genaral, thos opportunity was not liken.

One hy-product was an even more finely ground professionalism, within given definitions. Inevitably, the brightest young graduates did prasa to enter university staffs. But for every one who tried to think critically about the nacure of "the subject" itself, three or four took the present cules of the three or four took the present rules of the game as given, and sought to become expert

hut the sixties are now over and we have the binary system. We would have had that, fraeze or not; what I have so far seen of the polytechnics is much in their favour. I have in mind their movement into new binarches of the humanities and social selectes, such as contemporary contured studies, and configurately the services. studies and communications studies— London, From 1971 to 1976 ha was assistant branches the universities have largely director general of UNESCO responsible for lignared. There were some shaky starts, but social sciences, hunan sciences and culture.

A STATE OF THE PERSON OF THE P by new most of it is serious and carefully considered work; as are, too, the volubiling procedures of the Council for Sational Aradenic Awards.

But no motter how well some of the poletechnics perform and in no motion where new ways, I believe it was wrung for this country to have sought this solution to some of its higher education problems. While t was pre-uning this article I locked no my non our evidence to Rolding, Each or 1961. I see that I spent much of the time attacking the case for a type of double system which at least one member of the committee segment to favour; in that period it was the argument that liberal arts colleges could take the pressure of expansion off catablished mitrachities.

The the binary system we finally achieved sometaing less blarent bar no less wrong, wrong above all hecause it goes too moch teach the social grain, with that its in a for divisionates and for pecking orders which is always to be seen or less just below the surface in British society. It was a deliberately divisive uct in a habitually divided society.

society.

And what ironic wit invented the phrase

And what ironic wit invented the phrase "public and private sectors", which is both inaccurate and rendentious? The polytrelinits are not "public" in any sense which is not true of the universities; in some important ways they only be less public.

The naiversities are no more "private" than the BW or the Arts Council. They are largely antonous institutions established by royal charter to disburse public money for the advancement of knowledge, by research and teaching, in ways which seem right to their corporate professional conveiences, if we must have a paramuneau phrase me neight say "local ambarity and antimul"; or, to be os tendentions as is "public and private", why not: "Council-controlled and autonous"?

The proof of the contention that the higary system goes too much with the grain of our

System gors too much with the grain of our hubitnal divisiveness is all around us. Not only in the conversation of senior common rouns, the jealans comparisons of funding, the watchfulness and wariness, the roo-casy disonless) of polytechnic initiatives in subjects and methods, the unjust belittling of CNAA validations; but, above all else, to the inadequate communication and cooperation at all levels between the two sectors.

Lean times do not make far geocrous impulses. But we should begin to think better or we will let our present shuntian set us in mean habits which ore hard to breek when hence times do come; or we may be required to cooperate and "retionalize" by edict. At that moment the binary systom—because of its exact fit with one of our besetting weaknessas—would provot have been a Trojan horse of immense size. I have so far had experience of two CNAA to have been a Trojan horse of immense size. I have so far had experience of two CNAA boards inquiring into proposed degree courses. Fach went into the sulmissions in depth and at great leavalt. The difficulty in each case was not a lack of serious concern for standords. The difficulty was rather that each area of study is new and so he main lines are still being marked out. As a result, each committee became an area for debate about the nature of the lead course in the new subject, with the committee members themselves representing different opproaches only the proposals at risk of falling through the middle because no reasonable syllobus could be simply a see of compromises without a clearly defined edge.

In each case o good course is likely to emerge, because in the last resort the chalrmen and the bulk of the condmittee members know that people with ideas ought normally no he allowed great scope, oven though not everyone would ogree with any justicular approach. But this kind of searching scrutlny is useful, and would be hard to parallel in some universities when they are considering

their course proposols.

According to the national falk-lore, we live well with adversity. Perhapa if the adversity is a catoelysmic war, this is so. If the moad in many universitios today is any guide, we do not live very cheerfully with odversity in averydoy professional life.

The presont cuibocks seem to have encouraged in some people the unexpectoncy and restrictiveness which are all too near at hand in the British make-up, that disposition to say "no" before one has thought whether "yes" might after oil be possible, that "If I give you one, they'll all want one", Beerd of Guardians, "otere means we'se", spirit. It is also the spirit of that assumed law of the non-cremion of matter which makes us believe that if one nerson creates something new then it must have been taken from someone else, rather than that growth cun make

We could be using these years more than We could be using these years more than wa seem to be dolag for trying out aome developments which do not depend on massive new funds: auch as making the bluary systam an axample of intellectual and educational cooparation not of separateness, developing part time degree work which is both cheap and good, linking better with local communities, and promoting a thorough debate about the definitions of subjects and the relevance of syllabuses; in short, thinking again about basic purposes.

The author is warden of Goldsmith's College,

## ft : Chairs - , . . .

Mr Geotfrey Duocan Chisholm, semor protogical surgeon at tlammersmith Ab Wittiam Vangh, consultant Horpital and senior lecturer in uralogy in the Royal Posigraduate Medicul School, has been appointed to the chair of surgery at Edinburgh University

Dr Michael Brooks, of the department of geology, University College, Swau-sea, bas been appointed to the chair and headship of the department of geotogy at University College, Cardiff,

# Or Itrian J. Hrinkworth, currency teader in the department of median ral engineering and energy studies at University Enlege, Fordit, has been promoted to the newly created chair studies.

paedic surgeon at Harbur Wood Urijo-paedic and Nottingham General Hospi-lats, has been appointed to the char of orthopaedic and archiem surgery at Nottingham Dutershy from April 1.

Dr Leonordo Pomps, lecturer in philasophy, University of Edinburgh, has been appointed to the chair and head-ship of the department of philosophy, University of Birotogham from

## Awards Awar

The following approlatments to the birkness fellowahlps of the Commonecalita Panid 1977 hace been made : , C. Balleurs, hydrology, Huffer Hy f East Anglia; P. W. C. Calthrop, business administration, Arthur Amberson and Co; M. D. Dannazer, history, son and Co (M. 1). Damazer, history, Gonellie and Cams College, Cambridge ; A. C. Davenport, publical science, Far Eastern Economic Review ; P. M. Datesun, Liferature, Fligwilliam College, Cambridge; J. G. Honger, health ser-cless administration, Department of Health and Social Services, Belfast;

T. M. Jessell, neuropharmacology, Frintti College, Pambridge; A. R. Lore, public administration, Pendla Marthi Connett; R. F. H. Lascombe, Platter Connect; R. F. H. Lassonde, briefitational relations, British Army; C. W. Markenzie, business affiliation, flow the perfect of the Las Copperation; H. C. Manghan, public administration, H.M. Fredorey; R. J. P. Morton, business administration, Friday, R.S. P. Nathan, sortal history, New Hall, Cambridge; M. Byder, history, Fridity Hall, Fambridge; G. Al. Shanoth, Russian purity, New College, Orford; H. G. P. Sockin, business administration, Themteral Rank; H. P. T. Stopfant, Law, Brimel Bulversity; H. F. Waller, public administration, The Finnes Higher Rancation Supplement; A. S. White, Journalism, King's College, Cambridge

" ETO" 77", the animal Educational Pechnology International Conference of the Association for Programmed Learning and Educational Cechnology, is being held on March 28 to 11. The themeto hearhers and their use of the Further details from the P. J. Gills, conference secretary, histing of Educational Technology, Surrey University, Guildhold, Surrey.

# Universities

### Corditt

Director: Professor A. R. May 1 School of Erestonics). Eilinburgh

tachner: J. Herdman (crasses top., Fuglish literaturel: S. A.E. con (vetermany anatomy). Sticling

Production to readers: Dr L. Pudles (German); S. R. 542, phillesophy). senior etailing fellow: N. Wh. Is bendstryt. Lecturer: 110 Kennedy (politics).

Noticeboard is complete

#### Forthcoming events

The tenth sponal conference of the National Closed Circuit Television Associalism (NECCTA) will be held of the training " and " Educational Evaluation of CCTV". Enquiries to NECCTA Conference 1977, Conference Secretary, Dorer Educational Trebyston Centre, Harton Road, Dorer, Kent.

School of Pharmacy, University of London from March 28 to 31. Topics will to Surrey from March 38 to 31. Topics will to Surrey from March 38 to April 1. Papers will be presented on its evalua-

tion and assimilation by the idological, Har and assimilation in the monogras, medical, physical and engineering sciences. An exhibition of related materials will be open to the public on Weibesday and Thursday. Further details from Mrs. 1. Toye, information and Training Officer, Nathural Detechniques. ment Programme in Computer Assisted Learning, 37-41 Mortimer Street, Lam-don WIN 7RJ.

by Patricia Sentinelli

#### Open University programmes March 26 to April 1

#### Saturday March 26

8.06 Making sense of society: Hackett's Ocalyn Postures (DIDL: prog 7). 8.30 Fechaglooy; a Coundation course:

0.20 Topics in pure mathematics : Topic logy I (M202 : prog 7). 8.45 Introduction to engineering mech-anira : Volocity and Acceleration Ola-grams (1231 ; Prog 3).

An introduction to the chomistry of ration compounds: Home Observa-itons 1824 : prog 41.

12.40 Problems of philosophy : The Con-Mationalics JM201; prog 7;

STUDY AT HOME for a London University Externed
DEGREE

Wolsey Itali, the only correspondence college with full courses for London, I more att. External SA degrees, provides individual instruction by highly quotified Wokey. Hall has a remarkable record of

Wolsey, Hall has a remarkable second of income, a pass rate of over 90% is subjected in some degree subjects, including a high proportion of the 1st and important class honours awarded. Fourier cover B.A. in One Subject, B.Se., Alt Land II, B.Se. Econ, Lt. B., B.D., Landon Privile in Diploma and for 13 additional Cert, in Inducation, College of Presentors Diplomate, as well as a wale target in professional, career and G.C.E. subjects.

Leer prospectus from the Principal W. M. M. Milligan MBF, TD, MA, Rept BA1, Wolses Hull, Oxford ONZ 4691 Lelephone (0865) 54231 ( Americke after 4.45; p.m.)

### Wolsey Hall oxions.

According CACC Member ARCC Pounded 6814

OO Train Your Brain!

Shou inionalve courage of proctical training based on the work of Tony Duran. Reading inforcephty and fast, pellarnot notes, thinking and loarning strategies, memory, analysis, cilicism. Jevision, over technique, mollegion and concertication. concartation.
Guosi help with heaty studying or losening workloads, and easential groundwork.
In the workloads and easential groundwork.
In the workloads and easential groundwork.
In the workloads and the workloads at any level.
Study courses begin March 28, July
25, August 8, 15, ond 29, Eoptombe, 12;
elso weekend courses.
LEARNING METHODS
GROUP (THES)

MARCHES OF THE STUDY
LONDON NW11 77Y,
Tel. 91-455 0355 (2484),)

#### 6.05 Disense: Music in Medieval Drain's (ASD7 : prog 5). 0.25 Francisco and Education Policy (I.O.723 ) prog 25. Arts: a foundation course: Psycho-archicula and Liberature (Aton); prod 03.

O.05 Open Forum-H.

10.00 Personality and learning Similyton Learners (120) . Brog II.

10.40 \* Modern art from 1018 to the pre-sont; attles and social implications. Through of Art: (2) Schiller (A to); Prog. A.

11.40 Social Psychologic (0.365), gree A., Monday March 28 14.00 Remissance and Domination . Lorence de Medici as a Statesman QRC 1 (A201 : 1000 7) 14.20 Manupulent in editioning: The Edu-ration Part "Talgets for To-morrowr" (15.21): ploy 25. 14.40 • His sociological peranective: Iwo Perspectives in Sociology (0203);

18.00 War and accieve The Hundred Years Wes (A.ii) 1 pag 25. 15.20 Christalium design and development : lanzanii — I durat an for Bell-Heilance — Part 2 (1:205), orași di 10.40 | Irhan deretorment : Ibadan as an Object of Social Scientific Shots (0.120) : prog 51.

18.00 His half-leapered person in the run-numly Parents and Problems (1985); prop 21. 16.20 Patierns of Insquality Stopping the Loopholes (0.702); prop by 10.40 Language and learning: Octors fathing (E263; prog 5).

MADIO 2 IVHF1

#### Sunday March 27

Etonicitie and (solopes 12) (1810);
prog 71.

8.85 Secretary Secre 17.00 Mass Communications and Society :

10.38 Personality and Learning its it BSC 1 Blundleni 2 (E24) 1 prog 51. 5.40 11.25 Economics and Education Policy ( Learned Incomo (ED 322 | prog 2). 11.00 The Earth's Physical Resources I North See Oil 18266; prog 3) 12.15† Lundamentals of Human Outgraphy : Economic and Invironmental Impacts of Mining (19204 ; prog 3). 12.40 Curriculum Ossian and Licyclon-moni: Tanzania: Iducation for Seil Richance (2) (E203; prop 3). 12.05 An introduction to Psychology : Visual Search and Artability (D826t : prog 2):

8.00 English Urban History 1500-1780 : 17.48 Ari and bavironmost : Having fees English Totels 1A.23 : prop 2), Wanding Messials : ITAD293 : prop 2)

Mothin Sense of Sucleip : Leedlink (1910) : ptm 7). Eleptonis of Alusto Stationarillos to Aural Training (28 (A24) prop Ma Technology | Loundation | Louise : Mechanics (1100) | prog 6); OAUIO 4 SVHFI

 C.30 The Lath Gaussi Fundre and the Rise of Conclusive Planck Lapsaid the Friedrick Program of the Friedrick Program of the Friedrick Program of the Pr The Obligation paper. Answering a T.M. V. (191221), prog. 23.

24.00 The Vie of Revolutions National and the Grand Army (A202); prof. 75. Hymboance and Helprovilling; Infonce de Mediel as a Sintesman (A291 prog T)

0.40 Solids, Builds and gisses Atolela Buil a Cas (\$1206 : ptog \$). National intoine and economic policy the Mulliplier (1/1382) prog 2 :

11.25 House (Alt) plug to the local property of the light property of property

7.08 Printony: Woodland Occomponers 1825 printony: Woodland Occomponers 1825 printony: Woodland Occomponers 1825 printony: Woodland Occomponers 1825 printony: Woodland Maintenance I lighting bless by Hondillon Maintenance I lighting bless b

6.40 An intruduction to materials : Thermal Analysis (1825) prop 3) 7.06 Public administration: The Course and Your Laguity 10:31: prog 1: 7.20 Builtstics: an interdisciplinary nonproach lising the Computer: from tunomial in Normally (MDF241: prog 4)

0.40 \* Hiplugical Mases of Behaviour : Regin Strockure and Behaviour (51) 1966 7.08 Urban education : Mons (E361 7.30 Languago and learning : lloapital Rosaltius E462 : prog 21 17-20, Physiotogy of Cells and organisms: fransport Kinelics (5-21 ) prog 4.

DALID A LVIII-I Hash Present profits

Platfolia of Thillian and The Composition

of the Profit of the Composition of the Composition

Hash Thermal Composition of the Composition

for the Composition of the Composition of the Composition

for the Composition of the Composition of the Composition

for the Composition of the Composition of the Composition

for the Composition of the Composition of the Composition

for the Composition of the Composition of the Composition

for the Composition of the Composition of the Composition

for the Composition of the C

No. 20 - 1 then be set quarter to determine the determine to determine the determine to determine the determine to determine the determine the

Wednesday March 30 OOC 1

U.40 Resistance Helicetoni An Iralia de Silver Silv

7.30 Results of Catch Luni Mutant (Agent ; prog 2)

7.05 North Sea toll claim prog 5.

1.30 Results of architecture and design library of architecture and design library (2) R. M. Schooling Lawring 100. 1

Result library (A Str. plan 1)

1.30 Results library (A Str. plan 1)

West Surrey College of Art and Design

Lina Garnade Memorial Foundation

Inaugural Fine Art Award 1977; £800-00 Applications to in the U.K. or abroad are torited impediately fur tills award, which is open to arrise, workly in ony needom. Thuse who have completed an artise, design education within the past five years are not eligible. Cloting date for applications : I'riday, 20th May. Further details and application form from : Chief Administralire Officer, West Surrey Collège of Ant & Design, The Hart, Varnham, Surrey GUS 7DS.

17 20 St. de nos Henrybour : Air Red bent Henrybour (1211), phys

6 till i till a tillin i besten att for an til itte Halls Sized Mali, 10 20 tilen i bestelapanent i tild tilena of Longlid Phalics atenti (1179) tog 75. 6 dil instrum i firial and i tilling Law in tilling i filosome i tilling i tilling i filosome i tilling i 17.45 - 15.11.5 m Making in British Las 17.45 - 15.11.5 m Making in British Las 55 Menny - Landon Booling i

Opplacement programmes for seek in

# 

# **Exploring deprivation**

OVA .

Sir Keith Joseph : disinterring the "problem family".

jurily in the control of the outhors. First, us they paint out, such a recley is dependent on its sources,

Parily hecause of restrictions of

Cycles of Disadenutage by Michael Rutter and Nicola Madge Helmemann Educational, £6.30 and

ISBN 0-435-82851-7 and 82052-5 The Divadvantages of toequality: a Study of Social Depriculion by Richard Berthoud Mucdonald and Innes, £4.95 ISBN 9-354-04047-2

Shortly before Sir Ecith Toteph's very public conversion to the benefits of inequalities determined by the "free" market he topped another, never very the only distincted, set of British prejudices by distincting the "problem fuotily". There evere, he suggested, a small number of families telm remained a hunden on the state in a time of number of families who remained a burden on the state in a time of tising affinence because their problems reproduced themselves in generation after generation through some cycle of transmitted deprivation. Sir Keith's succeedes gare a further boost to the ulready has political and academic controversies over poverty and inequality in Britain, and indirectly stignidated

the production of these two books.

With the SSRC, the DHSS set up
a Joint Working Party on Trans-onited Deprivation which commis-slooed a member, Professor Michoel Ritter, to carry null a review of moy relevant literature (to declure on loterest, after this work had been completed I too became a working party member). In order to ovoid some of the more ulwing traps set by the notion of deprivation trans-mitted among a few families, the authors rightly felt they must extend their scope to look ut a wider extend ener scope to look at a wider range of disadvantoges and inequalities, continuing within os well as between generations; at the possibilities of transmission in classes,

lities of transmission in classes, groups and areas; and at a range of mechanisms including not only genetics and subcultures but also institutions and discrimination.

They distinguish between the societal determination of the degrees of inequality and levols of poverty, which exhibit remarkable continuities, and the foctors governing which individuals will come to occupy the lower levels at any point in time, where the picture is much more vorted. s much more voried.

Obviously the tusk of reviewing the literoture covering this lield was impossible: all human life is ere. Moreover the relatively sudden arrival uf pollcy issues soch as transmitted deprivation ("hattered telves" is onother soch issue) seems to each the acodemic cammunity with their transers flown, so that anyone looking for pulicy-related evidence must adapt moterial collected by other specialists for other representations of these causes related to other causes. purposes related to other cuntro-versles. There are problems of building bridges of common dis-course ond explanation between the "trained incompetencies" of the separate specialist fields of research. How could anyone master and order sufficient material even to describe. el aloue contribute to, such u range of controversy?

In fact Cucles of Disadvantage is monumental ochievement. The hy research methodology. task with remarkoble determination, industry and open-mindedness, to produce an invaluable commentery space, but also because this is the type of research which predunitype of research which predunt-nates to the literoture raviewed (and ona suspects tha typa favoured by the authors), many of the findings are in the form of associations be-tween "foctors". A typical research design looks at contrasting situa-tions, measures certain injury and oo almost 1,500 very varied references. The material covera fields as disporate os income and housing distribution and policies, intellectual attainment, social mobility, delinquoncy, subnormality, psychiatric disorder, parenning heliaviaur, ond ethnicity. The discussion income nutcomes, applies mathematics lu

suspect. Moreover, insofar as there singlet. Moreover, filstofar as there is "interaction" between factors it may differ over their range, white the "causes" operate in a kind of regressive chain of "levels". Thus, the relatively poor rest scores of West Indian children may be seen in terms of their material characters. in terms of their material situation, the parenting they receive, the kinds of schools they attend, and the tests they undergo, which in ourn are all product, of wider acial and histori-

problems of factorial analysis, Cycles of Disadvantage fails to pick to some erucial criticisms of the Plowden research; in operationalizing as "factors" the concepts of parental attitudes and material circonstanters the research supriously constances the research sporiously built in one of its most widely quoted and influential fludings, that "attitudes" may operate indepen-dently of "material circumstances". Not to lahour the point, it is doubtful whether factor analysis is no udequate mal for the exploration af influences such as social class, politi-cul activity, or heliavious in listitu-tions, although one understands the pressures of space and the semantic traps which have led the authors of Cycles of Disadvantage to describe research in terms of fac-

review is dependent on its sources, and the balance of research interest has been blosed in porticular ways, for example between societal factors in discussions of income and housing distribution, as opposed to individual factors in other areas, such os poreoting. (However, this only partly explains the neglect of the situation of women to both these hooks.)

Second, they have not included discussions of research on policy making (as apposed to policy interdisadvantoge are made to look rather thin. Although precisely because the trees are much aparser he is able here and there to give a o cleorer indication of the shape of the wood, and he has provided some clear charts and disagrams of the

Second, they have not included discussions of research on policy-making (os apposed to policy intervention and outcomos, which are dealt with to some extent). This is understandable given their reining the status of the working party, the difficulties of research in this area, and the lack of good intervention policies. On the other hand, the useful description of the very patchy pattern of failure and success in Operation illendistant and our awn Educational Priority Arcos (EPA) orles out for some further analysis of what went wrong of the policy. This book also offers to do more in the way of analysis, by discussing ootloos of the acceptability of inequality and the undakness of powerty. The author asserts that it is widely accepted that the range of inequality is too great, and dispendent against the power of the control of the con of what went wrong of the policymaking as well of the implementation level. And olthough some mention is mode of the schools
mitting ood confirming dismitting ood confirming disolventage, there is no adequate discussion of the workings of government hureaucracies, such us the
gome where the whola group of
munual workers ("on a loaing
wicket" and a "socially weak"

Bround are et a much greater sick group) are of a much greater risk uf low incomes, unemployment, dis-ahlement and ill-health; while "eviemployment services. Indeed surely, conceptually, there is no limit to the relevonce of studies of government policy-making out issues of inequalidently there is something obout those with high storus jahs which makes them, or their families, more healthy than those in low statua juba".

Third, there is the related ques-tion of research method. The authors rightly assert that as the problems and solutions of depriva-tion are multifarious, the search for one Correct research opprivaci the "contentious subject of social classes" and declines to speculate on what that "something" is, beyond the assertion that "there is would be silly, and os of ready noted neither purpose nor fruth in the they underline the bias in particular suggestion that the rich) are a pieces of research. On the other hand they do not explore sufficiently in the series of read of a sort of "chain reaction" pieces of research. On the other hand they do not explore suffi-ciently all the limitations imposul

He diagnoses the problem of non-manual/manual differences as "hindronces to free mobility". The institutions to discriminate against individuals and to promoto fraar social mobility for all the lower income groups by active labour murket policies. The sylls of inequality should be available if employars and the employment service wurkad together to make them

tric disorder, parenting heliaviaur, ond etlinicity. The discussion ducorporates perspectives and insights from specialisms as fur apart us genetics and economics at one end of the spectrum to social psychology and haballing theory at the other. Within their chusen limits this review of the literature achieves a degree uf comprehensiveness, rigour and clarity of expusition which quite disarma criticism. It also defies summary and abstraction but, to pick only one example, I found the discussion of genetic factors in ortal ment or remarkably balanced and constructive view of the original notion uf transmitted deprivation is shot to priblons, and have been difficult to explore because not factors, any limitations of the whole enterprise of the working party.

Any limitations of the buck stem

## Status in industry

by Clans tiffe

Edward Arnuld, £5.95 and £2.95 ISBN 0 7131 5892 1 and 5893 N

It is good news that the work of the German sociologist Claus, tiffe is now beginning to appear in English. While this book—a translating of Leistungsprotzip and in-districtle debent-is an early piece dietricile Arbent—is an early piece (his dienoral theora, published in German in 1970) and gives only minor indications of his bare thluking on the contemporary sine, h is well worth having in English.

Its theme is that changes in the nature of work in undern industry, together with wider social developingether with teider social develop-ments, have cruded the social base of the achievement principle, leav-ing the hierarchy of industrial organization and the division of rewards based on ideological and normative as opposed to objective economic criteria of efficiency.

The change on which he conceutrates is that which he calls the tinuous atatus organization. In the former situatino the work cuto in former situating the work cute in sany supervisory function incorporates and transcends the skills proctised in the positions beneath it in the bierorchy. In the lutter, which Offe sees as increasingly typical in modern industry, the supervisor's work is quite different from that of his subordinates and he does not share their skills. It is therefore difficult to assess the precise difference between his contribution and theirs. Also, the area of discretion open to the subordinate increases and his loyolty has to be secured through normative to be secured through normative devices.
The ochievement principle is

Industry and Inequality: The Achievement Principle in Work and Fernian and American evidence on the nature of occupational prestige to argue that, as the achievement principle derlines in significance su extra-occupational aspects of work positions become symbolic substitutes for assessments of rel-ative worth which can no longer have an objective base.

The implications of this dis appearance of true performance criteria are then traced in detail through two rentral aspects of occupational recruitment and mobility and jurouse determinotion. In both cases he shows have the achievement principle becomes the achievement principle becomes ideological rather than rational rolsing the possibility than objectively work could be organized or different bases.

The thesis is tightly argued and good use is nucle at secondary ori-dence. It needs, however, more direct evidence that the changes ir the pature of industrial processes on which the organism texts are as extensive as claimed, and that they do represent an overall tendency of do represent an overall tendency of imposed to a series of developments which are contradicted in other, chotrary chonges. (The alisence of such evidence, and the shortness of the book, are remited ers of the contoning differences between the requirements of a doctorol thesis in this country and in Germany.)

Offe's use of imellectual tradi Offe's use of intellectual traditions is sophisticated and well synthesized—in particular he is able to integrate Marx fruitfully integrate Marx fruitfully integrate of acclological theory. It is tharefore unfortunate that a simplistic Marxist introduction has been provided by James Wickham, who has otherwise made such a good job of the translation.

Colin Crouch

## **Essays on Hayek**

Contributors: William F. Buckley Jr, Gottfried Dietze, Ronald Max Hortwell, Shirley Robin Letwin, Fritz Maching, Gaorge C. Roche III, Arthur Shenfield ' Friedrich Hoyek's influence has been tremendous, His 'Friedrich Hoyek's influence has been tremendous, His work is incorporated in the body of technical economic theory; has had a major influence on economic history, political philosophy and political science; has affected students of the law, of scientific methodology, and aven of psychology.' So writes Milton Friedman in his foreword to this volume of essays presented at a special meetlog of the Mont Polerin Society in August 1975, devoted to an appraisol of Hayek's work. The essays deal with a wide ranga of Professor Hayek's scholarship, and a full bibling-raphy of his work and excernts from the citation accomraphy of his work and excernis from the clastico accom-panying his receipt of the Nobel prize are appended.

## Japanese Foreign Policy

1869-1942

Kasımigaski to Miyakezaka JAN NISH

Traces the pattern of Japan's pre-war foreign policy in the light of the personality and thinking of her individual foreign ministers. Dr Nish shows how the increasing preoccupation with warlike situations is reflected transition of the name Kosumigoseki, the Foreign to Miyakezuko, the War Offica. Foreign Policies of the Greon Powers Series £6.25

## **Pre-Capitalist Modes** of Production

BARRY HINDESS and PAUL Q. HIRST E3.75 (cloth edition £7.50)

> Routledge & Kegan Paul

39 Store Street, London WC1

Few demonstratings of man's

Landscape change

# 30045

## Revolutionary puzzles

The Russian Revolution: A Study la Mass Mabilisation by John f., H. Keep Weitlenfeld and Nicolson, £12,50 ISBN 0 297 77210 4

Was the October Revolution a muss uprising or merely a coun detat carried out by a few conspirators? The question has been frequently asled, and has been enswered, with passionate conviction, in both senses. But rarely before have we been given so much data as in this book with which to make our own

Professor Keep's method is to examine closely the various institu-tions through which mass aspira-tions through which mass aspira-tions for change were mobilized: the workers', peasants' and soldiers' soriets, the trade unions, factory tommittees, militio detachments, Red Guards, peasant communes and land committees. He devotes a chap-rer, and often more than a chapter, to each one, describing its structure and purpose, the political move-ments and leaders that came to daminate it, and the way they modi-

The result is very different from most accounts of the Russian Revo-intion: the party in-fighting at the top, whout which we are already well informed, is filled out with lesh ond hane as we see peasants pasturing their cattle on the land-lord's meadows and the metal pipe workers of Petrograd troudling an authopular official on in the works gates in a wheelbarraw. Keep's own conclusion is that the Revolution was hoth a mass rising only a coup d'état, with the Bolsheriks using the dynumics of the farmer to

echieve the latter.
The detailed and simultaneous nuravelling of high and low politics the frenctic way in which penple who had never known politics in their for their forchears') lives their for their forchears') lives suddenly set about luquiviring institutions through which they could express themselves polltically. The result was a hotel-potch of ad hoc committees, councils, burcans, congresses, conferences and what have you, all enshrined in the stuid, confident terminology of Western constitutions. At three one has to pinch eneself to reioln a sense of reality while reading their impercably worded resolutions.

Keep is a sober and religible guide, and keeps a grip bath on the main themes. He traces the ilfe af warkers and peasants from hefore

reality while reoding their Impeccably wortled resolutions.

Keep Is a sober and reliable guide, and keeps a grip inth on the roal world and on his main theres. He traces the life of workers and peasants from hefare the workers and peasants from hefare ontiook and their demands developed. The urban workers, many of them recent recredts from the commune (or sovier etc.), in search the countryside and retaining ties there, had been drawn into a way of life, involving horsh work, discipline, inadequate housing, and poverty, not of the drab rurat sout, but made sharper by the presence of obvious contrasts in wealth.

With the futers making for ryclical methods for ryclical methods and still and solidarity.

The war, he helieves, considerably decaded and illuminating attention keep has decaded and illuminating attention. Keep has therethed and detailed and illuminating attention the paramits of musiders, considerably privileged outsiders. And when they peasants. However, when an anthor has already done so much, it is churlish to retroach him with what he did not intend to do. This is an immensively valuable book of the economic security which had been him with what he did not intend to do. This is an inte



Parade of Red Army traogs on the Red Square, Navember 7, 1925.

one source which suggests a literacy rate of nearly 80 per cent among workers in 1918), and they were, he suggests, "attaining spantaneously a new awareness of their dignity as kuman beings, their rights as civizens or consumers, and their Latera power to enforce their will", Learning from political parties but refusing to be hound by dogma. The war added family discoptions, inflation and shurtages to their burden, and brought the urban poor generally, especially the

strident and pulitical, cluser in the Bulsheviks, who were able to pro-

In interpretting the peusant mave-In interpreting the pensant move-ment, Keep takes a strongly nen-Pupulist and anti-Murklet line, of the kind expounded by Chayanov and recently further developed by Tendor Shanin. He suggests that preway commonic differentiation and runfiter within the rillage reas telatively insignificant compared with the furces making for ryelical mobility and salidarity.

Most of them, especially the position, lecause of the enducing supermarket younger ones, could read and personness write findeed Keep quotes the world to go in hell, which is the position, lecause of the enducing packets.

Strength of cottage industry, which supplied most of their non-agriculture.

Geoffrey A. Hosking

Guards—the worker militias—sat this point, compared with most earlier historians). At the very least the subtier, were the leaven of the rerolation. It is a pity, then, that the hook has no special section devoted to them. This is deliberate, since as Keep nores, Aloa Wildoan is preparing a managraph in soldiers in the Russian revolution. Still, it is mutalizing to see these tagged figures in their treach roots and patters appear briefly at the vital montents without helpy given the detalled and illuminating attention, Keep has devitted in the workers and geasonts.

There are also some notable to the kind with what he did not represent the figures in their treach roots and patters appear briefly fished, but the model with the briefly fished, but the paint in the Philippines, and the littler at Poland's paint in the Philippines, and the littler at

Geoffrey A. Hosking

## Revised version

The Russian Versian of the Second World War: The History of the War as Tunght to Soviet School-

edited by Graham Lyons Lea Coaper, LLUS ISHN II 85052 2318

It was an excellent idea to produce a short back showing what Soviet schools rell about the Second

thine his job well.

Thu first thing that reestern reachers, and their pupils, still meel to know, is the immerse scale. of the Savier war effort and the appalling tall of Soviet lives, in the simplest terms, it is the plain truth that the Saviet armed forces made the higgest single contribution to winning the war. Though this is not unknown in Hritain, it tends to get lost in histories of the war get his in histories of the cac written in this country, which un-derstandably lay their main empha-sis on the British effort. It is also fair to add that knowledge of the Russian story was made difficult until about 10 years ago to Jack of published ntaterial, and is still in peded by a shortage of British undetary historians capable of reading sources in Russian.

The second thing that needs to be discaptions, inflation and shurtages to their binden, and brough the normal poor generally, especially the cumer, on to their side; the overthook of the Tsar hegan in the Petrograd food queues on International Women's Day.

Once the old regime was eliminated, the workers tried through their new organizations to win economic security and some measure of control over their own lives—aims which became progressively more difficult to attain as chaos enreluped the country. So the workers' detroands became more strident and political, chosen in the Guards—the worker militias—sat this point, compared with most partier.

The sectual tring that to each of the dust in the desaltre dust in the obtaint of the country is the desaltre lact, of the country, and industrial workers, were the total workers, were the total workers, and industrial workers, were the total upself on the obtaint of the worker and the resolution of the worker and the solition of the worker and the solition of the war this exametric state of the worker and the solition of the worker side, the worker and the front the played in the obtaint Societ version of the war this exametric than any some measure thing the solition of the war this exametric than any thing that the reasons, and the solition of the worker and the country of the worker and the solition of the worker and the solition of the worker and the worker and the solition of the worker and the worker and the solition of the worker and the solition of the worker and the worker and the solition of the worker and the solition of the worker and the worker and the solition of the worker and the worker and the solition of the worker and the solition of the worker and the worker and the solition of the worker and the solition of the worker and the solition of the worker and the worker and the solition of the consity towards, the worker and the solition of the consity towards and t known is the absolute lack of real crossity towards then allies de-played in the official Societ yer

ISUN 0 8014 0842 3

Herlite in November, 190 ; Midator did not reject at offer of a sphere of in-november the Persian Guit but for more the formation of the Sea Straits; and the Sovieties treasy of April, 1941, by Stalin diverted Japanese age acay from his mon borders. West Forepean colonies at United States, The Manie parte the that conversations conducted by the Aller "of to the Savier government of the confidential agents of Hills.

protesque distortion.
Lyons has added spedic dices on three especials versial subjects, on which is Societ interpretations, oreasi what he calls a "subment what he calls a "subment Western position". These may be discharacie negotiation adminated in the Rive Malator Pact, the Soviet Fire of 19.00-10 and the Warten R 1911. The second and the very well done, and in bal there is a serious Soviet cotuade and the sources which closen male it rather well In the first case, the!

argaments pie the usud co

the "western position" sai

nas contributed for essentially imper-sonal landscape over much of the United States. While a good deal of geographical research fucuses on of course westerners while: the Soviet Dubur had "har them by its part with the! geographical research fucioses of attempting in differentiate among areas, to characterize the personality of regions, Professor Johnson's study constitutes a useful corrective han what right those while the Strict Per Marich had to expect better In its endeavour to explain why sa many North American londscapes ment, escapes lite. The me ment, escapes he 300 min near against the 1939 pm fercor of is that it danged interests of the Soviet Union's payer the green light to f the that smosked Poland ut-smashed. France. What its of its regious are anonymous. The United States rectangular survey, which organizes land into six-by-six-mile townships divided into 36 sections of one square mila each 36 sections of one square tuils each, is the cadastrol system under which much of the land of the United States was surveyed. In fact, Johnson policis out that 69 per cent of the land in 48 states is entiguously cavered by the rectungular survey and 9 por cent is intermittently rovered in the remaining area, including Alaska. they had to tight Russharts France, they were oble to be 1940. Stallin departed France Section Trust in 1940, 8th result that he had no Second to help him when Hiller to Riosta in 1941. All the hystelecture description the first

Originating with the Ordinance of 1785, the federal survey may have been inspired by European precedents us old as centuriation, the Roman system of lond division, and the first part of this book investigation.

rectangular survey. Although this pure comains little that is not to be found in the existing literature on the survey, it does synthesize this literature very effectively and complication and land assignment as one of environmental perception.

Three Phases of Matter by A. J. Walton McGraw Hill, £15.00 ISBN 0-7-08-9063-6 ISBN 0-7-08-9063-6 ISBN 0-7-08-9063-6 Isln or convironmental perception. Order upon the Land: The US Rectangular Land Survey and the Upper Alississippi Country by Hildegard Binder Johnson Oxford University Press, £7.50 ISIN 019 S01912 1

Domestication of the American wilderness within the rigid geometry of the rectangular survey during the hundred years or so after 1785 meant that townships were laid out in a way which reflected essentially medieval entremy, of distance and certainly pro-industrial levels of transport and agricultural technology. It was becoming anachronistic even as the survey itself was being conducted. At the same time, one principle underlying the survey was much more empiralistic than feudal: common agricultural systems in a Few demonstrations of man's apparent supremacy over the physical environment are more strident than the vast spread of cultural anonymity and uniformity that is laid us a thin veneer over the richly diversa physical lantiscapes of modern North America. Generalising historians like W. P. Weld and dematizing journalists like Alistair Cooko bave tended to emphasize the role of particularly striking technological innovations as inclumentally important agents of landscape change. In turn, the claims have been advanced of, for example, the windmill, the Colt 45, the prairie plungh and barbed wire. common agricultural systems in a Europeon mould were unmoded in North America by the mid-1700s and North America by the and-1700s and the desire for assured ownership of separate property parcels required simple and accurate description of landholdings, the Ordinance of 1785 being a plan in support of such presessive individualism. New Professor Juliuson cames forward as a forceful advicate of the United States rectangular fand survey as the underlying cotalyst which, in conjunction with the destructive impact at the automobile and the Installment plan, has contributed to the creation of a distinctive due essentially inner-

Having discussed the general character of the survey, Johnson proceeds in a detailed examination proceeds in a detailed examination of its implementation and functional integer in the Upper Mississippi Hill Country. The emergency of the survey landscape is treated topically, so this book examines in turn township, county and state bounderies; land sales and woodlots; the evolution of the checkerbootd image of landscape held by contemporaries; the role of agricultural technology. the role of agricultural technology and the feacing of plots; the section roadscape; and the emergence of grid-pattern towns, Finally, Jahnson endeavours to bring the unst alive as part of the present landscape, in an assessment of the persistent influence of the original survey on the modern landscape.

This book, which is not invided This book, which is not introded to be a consprehensive study in regional historical geography, is instead a sensitive interpretation of one fundamental influence in the historico-geographical development of many North American handscapes, It is without doubt an excellent addition to the alternity substantial and important Andrews II. and important Authers H. Clork series in the historical geography of Nucl. America.

Alau R. H. Baker

Eliptic problem

An introduction to the Minhematical Theory of Finite Elements by J. T. Odem and J. N. Reddy Wiley, F17.50
ISBN 0 471 65261 X

The history of mathematical concepts or techniques to be successful and the metical Theory of techniques to be successful and the mathematical mathematical besis is rigurously analysed and understood. The demands of research in the sciences generate working mathematical mathematical besis is rigurously analysed and understood. The demands of research in the sciences generate working mathematical solutions to problems for the thing mathematical solutions to problems for the first fir

first firstance not rigorous justification but practical result. However, in the inclining estate shown to be both successful and of sufficiently wide applicability, they inclined the successful and of sufficiently wide applicability, they inclined in the second half the theoty of finite elements as such. Following a thorough discussion of finite element interpolation, earlier interpolation, earlier mathematicians and are incorporated into the general body of mathematicians and are incorporated into the general body of mathematics of ficite element interpolation, earlier mathematicians and are incorporated in the elliptic problem in a variational setting firmly rooted in the elliptic problem in a variational setting firmly rooted in the elliptic problem in a variational setting firmly rooted in the elliptic problem in a variational setting firmly rooted in the elliptic problem in a variational setting firmly rooted in the elliptic problem in a variational setting firmly rooted in the elliptic problem in a variational setting firmly rooted in the elliptic problem in a variational setting firmly rooted in the elliptic problem in a variational setting firmly rooted in the elliptic problem in a variational setting firmly rooted in the elliptic problem in a variational setting firmly rooted in the elliptic problem in a variational setting firmly rooted in the elliptic problem in a variational setting firmly rooted in the elliptic problem in a variational setting firmly rooted in the elliptic problem in dary conditions since the interpola-

## Cheece Phases

The lactor that determines the phase—solid, liquid or gas—in which a substance exists is whether

muthemenical complexity. This book has its origin in a first-year under-graduate course and a porusal of the first third all it confirms this thu first third ullit confirms this. In contrust, the treatment of Debye's theory of the heat capacity of a sold talket simplified is pretty taught going, while the subtle cancents underlying the electrum theories of metals may not be readily assimilated at this stage of academic attainment. The liquid phase is notoriously difficult to treat quotationizely at the atomic level—Walson's approach using simple models. titotively at the atomic level—Wal-ton's approach, using simple models, is involved (he admits it may look formidable) but it is difficult to see alternatives if the book is to live

tip to its aim and litte.

Clearly the tunge of material that
must be included in such a general work is immense and it is not sur-prising that fluctuations occur in the level of presentation. Written in a racy conversational style which makes for compelling reading, I appreciated his fresh views of famil-lar territory, such as the section on lar territory, such as the section or the Maxwell-Boltzmann distribution There are numerous worked exercises and each chapter ends with summary together with a selection of graded problems out onsivers.

Least action

# Classical Field Theory by D. E. Soper Wiley, £12.90 ISBN 0 471 8136 8 0

Classical Field Theory has devel

Graham Flegg

### Plasma theory

Plasma Physics by E. W. Laing Sussex Duiversity Press, 15,00 ISBN 0 8561 0519

This shart book on plasma physics is hased squarely on third-gear undergraduate and postgraduate courses given by the author who is a reader in physics at the University of Glasgow. There are many excellent fea-

There are many excellent fea-mires, particularly those introducing the reader to the wore difficult parts of plasma theory. These include a fairly complete account of the MIID stability of a cylindrical plasma column facluding inter-change modes and o derivation from the energy principle of the Suydam stability criterion. Kinetic theory developments from the Lingvillo theorem, through to the BBGKY hierarchy expansion precede an illuminating discussion on multiple time scales. The dielectric constant fur a lint plasma in a uniform mag-netic field is derived in a manuor following floruscia. The enacept of magnetic surfaces is described by a magnetic surfaces is described by a stream function for an axisyometric toroidal plusing.

toroidid plusina.

Some of the more basic elements of the subject, such as the relotive magnitudes of characteristic lengths and frequencies could have been more clearly expressed. Sintements are made and formulae quinted often without explanation, for example, the author states that we would outmally require the number of particles in a Debye sphere to be a lorge number in order to have a plasma at aff. But he does not explain why.

Subjects, ore presented in a cutious order. For example, stability is considered before magnetic confinement, and the maments

of the Baltzmann equations are de-rived after the fluid equations have been used. Ohm's law is not derived and is only quoted in full near the end of the book (without defining the retter resistivity). Fartier the observed pressure against the reserved electron pressure gradient was re-placed by a density gradient, and throughout the book the Holl effect is largely neglected. By not deriving such fluid equations formally the author also misses an opportunity for showing when guiding centre theory and Huid theory are equiva-

For the reader who wants a kroader view of the applications and methods of plasma physics there are methods of plasors physics there are lattoductory chapters on astrophysicol problems, faser fusion (superdense plasons), and on computational methods for modelling plasons. In the last chapter the basic ideas of implicit and explicit numerical schemes, unmerical stability and the treatment of advection, diffusion, and particle-in-cell schemes are described. These chapters could trigger the enthusiasm of a student to pursue the topics in of a student to pursue the topics in more detoil, but occasionally the reader is confronted with a list of "blockboard" headings with no

Important subjects omitted from the book include high frequency cold plasma wares, brems-strahlung and other radiation processes, lanisation and other atomic processes, transport theory, ion acoustic ond other instabilities, and diagnostics including scattering of radiation.

However, in a book of only modest length many elements of plasma theory are covered well, and it will be a useful addition to those requiring o first textbook.

M. G. Haines

# Annotated Student Texts Series Garral chites: M. ROBERTS and D. ROPER

This series has been devised to encourage the reader to read the text of the author whose work is being studied. The books do not contalu individual pieces, but are key volumes, so that each piece appears

Readers will find they contain 'slandard' texts on conventional littes; the text of a poeur will normally be that which the render is most likely to meet in other contexts.

Other features of the series are: a list of principal dates in the author's life; critical extracts, and a hibliography. Titles in the series to date are as follows:

BLAKE - Songs of Innocence and of Experience BLAKE — Songs of Innocence and of Experience
and Other Works. Edited by R. R. Kennedy £1.65
BROWNING — Dramatis Personae. Edited by F. B. Pinion 85p
BYRON — Don Juan (1819) Edited by Brian Lee 75p DRYDEN - Absalont and Achitophel and Other Foems Edited by Philip Roberts £1.25 HAZLITT — The Spirit of the Age

Edited by E. D. Mackerness £1.58

REATS — Poems of 1820, Edited by D. G. Gillam 75p

MILTON — Poems of 1645 and Consus. Edited by Brian Nellist £1.50

POPE - An Essay on Crftlcism. Edited by Rathward Southall £1.75 RUSKIN - "Unto this Last", Edited by P. M. Yarker 75p

SHELLEY - Alastor and Other Poems Prometheus Unbound and Other Poems; Adonais, Edited by P. H. Bather &r.oo TENNYSON - Poeme of 1842. Edited by Christopher Ricks £2.00

EDWARD THOMAS - Poems and Last Poems. Edited by Edua Langley £7:75
WORDSWORTH and COLERIDGE — Lyrical Balinds 1805.

Edited by Detek Roper £3.00

FREE Educational Colologue:	(Hipection copie	s of any of co	& WOUNE And G
TTLES			
IAME			<u> </u>
CHOOL	·	<u> </u>	
ADDRESS	!	<u> </u>	<del></del>
kan kan digir dan dipinah di kacamatan ka	<u>{</u>	-1.1	<u> </u>
Write to: Macdonald & Ev	dans Litover,	Plymoutic PI	ひつけん

Diplomatic shortcomings

Anglo-Turkish Relations, 1933-1937 by Ludmila Zhirkove Seckee & Washurg, £5.00 188N 0.436.59265 X.

In could, lowever, be argued that he hasher it any fun particular in the proposal country of the Balgarian Community Polyton in the Englishment of the Eng

Russian Modernism: Colluce and the Avunt-Garde, 1900-1930 ediled by G. Gibian and H. W. Tjulsmu Cornell University Press, 18.75

Literary groups

deares a dividing-line st Mil-accepted date of death of sig-tant Symbolist mosemen, I Patra in Carden argues thinks, at any rate, Modernian in-motion with monamentalism, ancludes the work of Re-Remuzoe in the earliest years

Hugh Scion-Wa

# 

## Disciples and adversaries

Bergsun and his Influence: A Reassessment by A. E. Pilkington Cambridge University Press, 19.00 ISBN 0-521-20971-4

Dr Pilkinginn's study, Bergson and his Influence, serves three distinct purposes. It offers a fresh account of Bergson's philosophy, it reintroof Bergson's philosophy, it reintro-duces the reader to the hasic con-cepts of the thought of four of his contempuraries — Péguy, Valéry, Proust, and Benda—and more sig-uificantly, it proposes a new evaluation of the boundaries within which intellectual influence can legitimately be detected. This last aspect, a by-product so to speal; of the comparative approach, gives the bank its distinctive interest. book its distinctive interest. Pilkington's stated aim is to get

beyond admitting the existence uf a "Bergsonisme latent" to establishing cuncrete relationships. The writers mentioned were chosen per-haps for "firmal" reasons. They are symmetrically related: Pégny rhe disciple, flendn the adversary. linked on a controsting basis: Vuléry and Proust, both disclaining direct influence. This is aesthetically satisfying. Yet would not Bergsun's cause have been better served had his influence been shown to operate on genuine philosophiers? Would not his fame have appeared more enduring if Pilkington had chosen more recent "ritnesses"? Bachelard and Sartre spring to his belief cancerding the personal mind. Surtre, admittedly, is effectively introduced in the conclusion. The Parkelant Victor in La 1821. sun's cause have been better served niind. Surre, admittedly, is effectively introduced in the conclusion. Not so Bachelard. Yet in La Districtions of the language of the last interesting the last interesting the last continuid—l'existence the cast interest is facused on the former, he have done fully discuter that the concept of intellectual influence has again been and the concept of intellectual influence has again been and the concept of intellectual influence has again been and the concept of intellectual influence has again been concept of intellectual influence has again been concept of intellectual influence has again been contended. te la continuid—l'existence de ces lucines devait être naire prantière tache, il nous a danc fulla discuter la famense dissertation berg-sonienne sur l'ilée de néant . ." (VII). Duration and inexistence: Buchelard's fillation is clear; his opposition tu Bergson more mean-ingful than Benda's misrepresenta-

fines, outlined by the four writers, Pilkington has admirably arhieved his aim, presenting Bergson's these and then following their impact. Impact is the operative word, for anterven Péguy the disciple con he said to reflect the master's thought. Rather does he react to it with a "résonance nouvelle" to such an extent that his agreement with Bergson Imistrust of language, it is a post painstakingly respective. There wor from the divergence, the primacy of the instrument. There wor from the start a change of register, Bergson's pure speculpium on a psychological place being applied by Péguy to a hisrorical entrext, but to this succeeds an outright rejection of lacegson's later method to the coul of the movel. Of these, the primacy method to this succeeds an outright rejection of lacegson's later method to the movel of these, their continues and measured time, their romain attimbe to language as separating and measured time, their romain in attimbe to language as separating and measured time, their romain attimbe to language as separating and measured time, their romain attimbe to language as separating and measured time, their romain attimbe to language as separating and measured time, their romain attimbe to language as separating and measured time, their romain attimbe to language as separating and measured time, their romain dustrines of humanity to language as separating and measured time, their romain attimbe to language as separating and measured time, their romain dustrines of humanity in divergence between three and measured time, their romain attimbe to language as separating and measured time, their romain dustrines of humanity and divergence between there and measured times that and measured times, their romain dustrines of humanities for the measured times and measured times and measured times from the call divergence between there and measured times from the call divergence between there and indivergence between there and indivergence between there and indivergence between there and indivergence bet

arous replace the previous recourse display the spontaneity, indeed the transference in influence is transference indeed: cumplex indeed: transference in-valves transformation, allegiante to the early Bergson becomes rebellion. And so with this first most prunis-Bergant's thought has triggered re-actions, ronsmant and divergent; ir has not really moulded, influenced. With Valery, the concept of influence suffers a new bloy. The

poor's admitted ignurance of Ben-sor's main works makes it paradoxi-cul to infer influence. Yet Pilkingum loings to light remarkable similariemlangered.

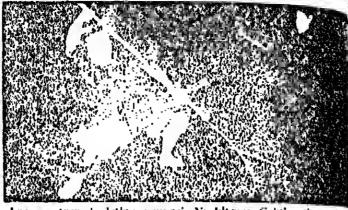
onionies dissertation berg.
onionie sur Pille de néant . ."
VIII. Duration and inexistence:
Buchelaril's filintion is clear; his
population to Bergson more meanneful than Benda's misrepresentalans.
However, within the literary cuttoutes the parallel distinction in

Recessor's layer method when in two at least, connected with the L'Ecolotton Cedutrice verbal explan-starched napkin and the desimplyo

heen noted here, a deeper divergence is unitted elsewhere; has Prinst benefited from Itergson's view of continuity to the extent a repudiating psychological associa-tionism?Re-reading the Amour de Suoma one might doubt it. However, there emerges from the com-parison with Pronst so much that is illuminating—on art and laugu-age, habit, humour—that indved more praise is deserved that stric-

tures. With Benda, influence is dealt. final blow. He had close knowledge of Rergson's works; hence the possibility of genuine Unks, Hur Hemia deliberately wisomdyrstands key concepts or transposes Bergson-ism "from the level of explanation in that of moral exhuration. We have come full circle: Henda the adversary, like Péguv the disciple, testifies in the impact of Herason's thought by adapting or distorting it.
Plikington's conclusion upons su
many new prennes that it could be exnauded how a second redunte : n tribute surely in Bergant's far-reoching theses but also to Pilking-ton's mastery of his subject.

Ninette Bailey



Lacquer tray depleting samurai. Vashitsone fighting the number munk, Henkei. From The Samurai by S. R. Turnbull, Hsprey, 20

## Politics rejected

Epicurean Political Philosophy: the Ite cerum natura of Lucretius by Jumes II. Nichols, Jr Cornell University Press, (8.05 ISBN 0-8014-0993-4

Virhols's plan is to study Epicarus's political philosophy as it is trans-utited to us in the Latin hexameters of his devotee Lateretius. The difficulty about this is that there is not much political philosophy in either of them. If you read to live in peare and enjoy rour life, you must be free from fear 1that includes superstition), and you must be free from ambition (that includes judi tical authirium): Epicurean political philosophy is a refection of politics, and not worth priting a book about Nichals attempts to surmount this

difficulty by writing three chapters summarizing lawretine's poem on the notine of the universe, and one on the political philosophy of Hobbes, Montesquien and Rousseau. This is all very well. Epicoreanism is a paw stol and fascinating philosophy paid offid and fascinating philosophy Late thus is a great pact, and Niv ds gives a sensible squrey of his thought (except for his attempt to resuscitate the old idea that Later thus was an atheist, but he still fails to produce a book to match his tith. True, a short passage of the end

of Lucretius's litth book of invaginative reconstructor of development of human men-three phases, the printing he political and the political to

of Lucretius's lith book definition in the language of the construction of the many properties of the construction of the many properties of the political of the care of the political of the po

Paluical philosophers a sel-bearn multing from this bod, as such they would be sell st Against the modern tide

Prose 1959-1974

by James McAuley

Oxford University Press, £7.50

The History of John Bull belongs to thot special klud of literature whose influence has been much greater than people's readiness in read it, or than any distluction that might ressonably be claimed for the quality of its writing. It is possibly the least read of any work that ever created a potent national mythology. Everyone knows what John Bull stonds for, honest, plain-dealing, mipredictable, courageous, stardily independent Englishmen, rightly entenphons of foreigners with their

THE TIMES HIGHER EDUCATION SUPPLEMENT 25.3.77

Origins of a myth

John Arbuthnol: The History of John Bull clings to the special kind of literature whose influence has been much greater than people's readiness to read it, of than any distinction than might ressonably be claimed for the qual-

their livid.

The live paraptaters have indeed sometimes been thought to be by Swift, and were included in some editions of Swift's works. They were collected in the second volume of the Pope/Swift Miscellauies in 1727, with considerable mudifications and with unter in which Arbuthant may have had no part, and some of which were probably by Pope. They merged waturally into the tangled net of Striblerian publication, with all the elements of multiple amborship treal or rumoured which this limitation, which this limitation in the land of the limitation of the land of the of than any distriction than might ressonably be claimed for the quality of its writing. It is possibly the least read of any work then ever created a potent national mythology. Everyone knows what John Bull stands for, honest, plain-dealing, mpredictable, courageous, standily hidependent Englishmen, rightly canteepinous of foreigners with their bogus transfly Frencht refinements and their devines ways. The storm treal or rumbured) which this implies. The editors discuss this skilfully, and oscribe the authorship of the 1712 texts limity in Arbuth not; while nut ruling our the possibility of some rullahoration by ather members of the Tory rirele. Their text is based on the first edi-tions, but the 1727 material is fully recuriled.

In buth the introduction and notes, the editors are highly lofor-motive and helpful. There are a few minor slips or omissions, "Publisher" does out mean poblisher (p laxviii). The words "nominal" and "real" (pp 28, 1590) probably corry an allusion to Swlft's Argument Against Almishing Christlanity, published the previous year, and there are some integrints. But these are small things.

C.J. Rawson

# An old quarrel

edited by E. B. Lyle
D. S. Brewer, 13.5B

ISBN 9-85991-020-2

This collection of specialist articles appear with a thoughtful reconsideration of an old quarrel; were the ballads independent productions, whether of "the Iblk" or individuals, or were they degeneration of the asyle-haunting ministrels long narrative tomatics? Nygacd's sensible conclusion—which the listory of later hallanly would remained the first kind, some all the second.

John Sinclair caucludes the volume with an account of a foscinating experiment invulving Keats's Labelle Dance Saus Merci and six studeots, reveoling how rapidly orally ronveyed texts will change and on what principles they do so (linguistic analogy, monderatization of language, mismalerstanding, Allan Rodway)

Allan Rodway

and approximation to forgotten detail).

In herween these

#### Reviewers

Among this week's reviewers:

Dr Ninette Bulley is senior lecturer in Freuch at Birkbeck College;

University and author of Mothers Alone: Poverty and the Fatherless Family. A. O. J. Corlishut is G. M. Young C. J. Rawson is professor of English lecturer in nineteenth-century English literature at Oxford. His books luclude Anglican Attitudes; Professor II. G. Hapkins is in the

Professor II. G. Hapkins is in the department of multientalics at UMIST. He is editor of The Journal of Mechanics;
Geolicey A. Hosking is director of Beautiful Engine 1801-1917;

Dennis Marsden is seniur lecturer in he sociology department of Essex Asia

Russian studies at the University Lieumennt-Colonel G. E. Wheeler of Essex and anthor of The Russian was director of the Central Asian Constitutional Experiment; Hesearch Centre 1953-68. He has was director of the Central Asian Hesearch Centre 1953-68. He has written a number of books on Suriet

## A literary artist

John Stuart Mill by R. J. Halliday Allen & Unwin, E5.95 and £2.95 ISBN B 04 320113 M and 320114 8

Unlike Germule Himatelfurb's recent book on Mil's Liberty, buth August and Halliday argue for the

August and Halliday argue for the muity of Mill's thought.

August addresses himself to the general reader oud although he offers no new interpretation of any of the major works he draws our strenting to a side of Mill which is seldom discussed, namely, that he was "besides being an intellectual glout... an impressive literary no was "besides being an Intellectual glont, an impressive literary artist as well". His principal principal manifest en imaginative aspect; an aesthetic concern for balanced carrative matching the precision of a logical mind. Honco, for instance, On Liberty is axhibited as a drama depicting the clash of opposing forces; of society against the ludividual and liberty against power. The struggle between individual and society dominates the first chapter of Mill's essay whereas in the socond the confilet between competing oppulons halds the centra of the spage; and in the third a of the stage; and in the third a contrast is drawn batween proved in the child a proven as opposed in painful restriction and atrophy the wildness of Ningara is set ogalust the sluggishness of a Dutch canal ".

> MATHEMATICS OF P. H. Francis

THE OLEANDER PRESS,

17. STANGGATE AVENUE, ...

Einstein's equation E=Mc2 is a particu-ist case of a more general equation relating mass and enargy. This month, US\$13.60 UK24.85 THE STRAIGHT LINE AND THE CONIC SECTIONS P. H. Francis

As a general survey of Mill's throught, hawover, August's bank has pathing to recommend it uver Alan Allen & Unwin, E5.95 and £2.95
ISBN B 04 320113 X and 320114 8
John Stoart Mill: A Mind at Lurge
by Eugene August
Vision Press, £6.40
ISBN B 85.478 443 8

when he gues out to say that "all interpretation is selective, and all selective, and all selection is arbitrary and partial", the "arbitrary" bothers me a lot. Dues he thean to countenance on interpretation that ignores the impact of the "mental crists" and rests entirely on those passages which suggest a continuing alleginace to Bondamism? Or an account of the final book of the Lagic that failed to appreciate the effect of Macuilay's criticism of his father? (A matter on the impuriance of

## Daild The Grammar of the Real : Selected Hidden greatness

defineation of Neitsun's special qualities. The essay on Roseaway hobson has given me o new appreciation of the elegance and subtlety of her work. In this study of Judith Wright, Australia's finest lights poet, McAnley's particular hent sometimes lends him to misinterpret her deliberate harshness and to miss the irony in her religious allousing, but his analysis of her use of metre and structure is valuable.

HIGH REY AT USA

A DEPTH PROPERTY AND THE PROPERTY AND TH

## AB Jossey-Bass Publishers 44 Hatton Garden London ECIN 8ER

Spciological Methodology 1977

edited by David R Heise

This new volume, the eighth in a series sponsored by tha American Sociological Association, concentrates on longitudinal and historical studies, mirroring the change in disorientation, withdrawal and helplessness-on old people use of these data in understanding social dynamics.

336 poges @ March @ £12,35

Last Home for the Aged

Sheldon S Tobin and Morton A Lieberman

Examines the psychological and psychical effects—such as dsorientation, withdrawal and helplessness-on old people entering a long-term cara institution. With case studies and recommendations.

320 pages . January . £11,50

The Future of Adult Education

A factually detailed analysis of the history of and recent, developments in adult education, recognizing the need for It to assume a more important role in higher education,

256 pages ♦ April € £8,95

ofted transcription of the conference of the later of the The Craft of Teaching Kenneth E Eblo

A consideration of the particulars of the professor's art. within the framework of a humanistic and personal approach to teaching providing specific advice and realistic suggestions to improve teaching standards.

en this things had the de voices of the product of the second Children and State of the Control of

وعورت منته ويهيز الدماء يويعا الديوار والأثار عاليه

अक्षात्र देवीका वार्

#### Equipment trends

Sir,—Ray McAleese quotes tTHES, February 181 the example of chised circuit television investigation in the early 1970s (surely the 1960s as well?) to chide me for wanting educational equipment in lead rather than follow develop-tional ments in other fields. In actual fact the las cited that prime example in support of my argument.

Sir,—As one currently engaged in writing a biography and clitting the writing abiography and clitting the "rimalist" position on the vexel question of the relation hetween the newly teprimed comment to provide the newly teprimed gion; namely, that ritual was primary 25L By now, all provided that prime example in support of my argument.

Sir,—As one currently engaged in writing the writing a biography and clitting the "rimalist" position on the vexel question of the relation hetween the like to comment on Provust Leach's gion; namely, that ritual was primary with myth a secondary growth or accretion.

Frazer may profitably he seen as an example of a rectain kind of support of my argument.

the great majority of institutions | both these installations were designed to him, of interest now.

The factioniles tos closely parallel as | 1 should like to suggest that these installations were tresigned to be facsimiles (os closely parallel as the quite generous funds permitted) of broadcast television studios and related facilities. Not surprisingly, praducers and engineers were wood eway from the BBC was William Robertson Smith, and and TTV to use and care for this that Frazer's few emilessly refire-equipment, and they in fuch rein-forced the concept of CCTV had been supported by the concept of CCTV

Now it cannat be denied that in the long term higher education has been enriched by this infusion of professional brandcasters and media men. The cost however ni wasted and unneeded focilities has been great. This would not have as forquative in the early years at occurred had there been more arrention paid to the teaching and enacent as expounded by his Glassian. tion. If the educational use of technology had bean subject to the same sort of discipline that is cus.

ithat a similor pattern of events may be recorring, and equipment means that no great aheration in general orientation was required of (computers? telecommunications? data storage and retrieval?), may once again exect a degree of the comparative method, of the comparative method, of the comparative method, of the comparative method, and the properties of the comparative method, of the grant perfect of the Brymmor Jones committee; capericances of recent years in higher one further education suggest very strongly that the time is ripe for a new high-level inquiry such at the organization and motions of teaching out learning in the post-secondary sector.

Policy of the described of the grant was made to the properties of the brymmor Jones committee. The properties of the grant was much mare complex and ambiguitant that "discipleship" might the organization and motions of teaching out learning in the post-secondary sector.

Policy of the grant was made a prima facte that a prima facte and indicate in the case than Prazer was not merely an initiation of Smith land a pair magnitude of Smith land a pair of Smith

Devolopment unit, Queensland Institute of Techoology

#### Film costs

EN AL

Sir,—I om not sure on what basis the figures which suggest that the postgraduoic diploma in film studies of the Siade School of Fine Art corners 26 per ceot of the cash for the beuefit of only 7 per cent of the students were originally calculoted, but I do know that, et a steff meeting last week, Professor Goving withdraw these figures.

Teking into account the fact that Goving withdraw these figuras.

Teking into account the fact that MPhil end PbD students (who have only started to be admitted this decode, end not from the beginning of film studies at the Slade) profit from the diploma course acroenings, and that axpenditures on film studies are oot limited to expenditures on the diploma course. I would have estimated that 121 per cent of Sieda studeots consume cent of Sieda studeots consume approximately 11 per cent of the annual grent. Moreover, when less than 12 months ago I discussed possible economics possible economies on the course with Professor. Gowing, I was encouraged to go ahead to run the best possible course.

Yours eincerely, Director of film studies, Slade School of Fine Art.

haps hes volumes yet to be released—with some reference to released—with some reference to the verse of Sponser, Milton and

M. HARDMAN, Department of English, Warnick University,

#### Frazer and his influences

LETTERS TO THE EDITOR

Bryannor Joses report in 1965. In ment that myone can ever have Senties, and Frazer rould only the great majority of institutions found him, or even worse finds withdraw. It give the Frazer-

ones at thut. But the letters and diaries show

in new industrial plont.

States rather than more overt behaviour—was early in place, for it is in new industrial plant.

Unfortunately, there is evidence that a similar pattern of events may be recorring, and equipment means that no great alteration in

BEd constraints

he has cited the prime example in support of my argument.

A rapid and expensive phase of CCTV installation followed various DES reports and recommendations during 1965-66 and—in the case of nalversities—the publication of the natural content of the natural

cannexion: the relation was much more involved and much less unldirectional than connoted by the simple "dependence" that Leach describes. Leach would have been more accurate to say that what Smith did was to turn the erudite young classicist with already-existing fulkluristic interests into an

anthropologist proper.
After all, Frazer had read Primitire Culture several years before he met Smith, until when the project inpermost in his mind was a translation of and commentary upon Pausunius. Ir was Smith's per-

Sir.—Mr Nokes' clarification (THES, March 4) of Stephen Culten's rother disturbing report on current BEd degrees (THES, Pelitruncy 25) was most welcome, hur he should recognize also that some of the constraints introsed by Tho Council for National Academic Awards policy ore contributing in no smoll woy to the very problems ho is discussing.

Pope's hypocrisy

Sir.—Douglas Brooks-Davios halls
Jemes Resyes's discovery of
"Pope's hypocrisy" (THES, March
4). Might one not—ofter e glance
at Aristotio—sea os much value in
thot tendeocy as in those towords
genocide, forgery, or maltreatment
of wivas, on each of which the
Helhemonn Educational series perhaps hes volumes yet to be
released—with some reference to

The "eluggleh progress" made by some of the courses under consideration by the CNAA could well heppeos, sideration by the CNAA could well yours faithfully, failure to advise its clients of olter condinator for hendicopped strains and the country of the numbers dents, game rather than of "difficulties North East Landon Polytechnic."

staff are facing ... over reduced S.S. Great Britain Mr Nokes' research team could Sir, I would like to draw atten-

Yours sincerely, K. E. ROHINSON. Deputy principal, North Riding College of Education, Scorborough.

#### Handicapped students

Sir.—Attention has been focussed on costs per student in further education, and will no doubt he oddressed to the conclusions of the

Coordinator for hendicopped stu-

because their work makes imaginawithdraw. If give the Frazer-Marct letters in my "Frazer and Myth and Rimal", J. History of Incus, January 1975.)

But this sort of selective unnestating quite typical of the Frazer-Smith canneston; the relation and much a reaction has been especially

In the case of authropology such a reaction has been especially severe, with a total turning away from the kind of belletristic comparative evolutionism of someone like Frazer, who for bong has been regarded as the epinone of how not to the authropology.

But Frazer as a modern mylk-maker—one whose work has created important intages and 1975 it had fallen to 3.5:4. & metaphors that have resonated in the consciousness of our renturywill continue in retain a certain importance for the general culture, no matter how unreliable he is on matters of fact (and it is true that he is sometimes unreliable, naive, otherwise the problem; all the contents of the problem; all the contents of the problem; all the problems in the problem; all the problems in the problem; all the problems in the problems in the problems. inportant, the fact that he could give Frazer's direction.

If I have marks a local and the fact that he fact that he could give Frazer's direction.

In the fact that he could all an interest the thoroughly he has been disavated by one gamp of his professional descendants, the anthropologists (although nor by the historians of religion, the state of the historians of religion.

point of view at the evolution at appropriate range of o pos-

save themselves a but of time if thus to a heurtening established at they caught the train from King's the Science Museum, it consists of Cross us sum us they are appointed. The weather here is marvellous in the moment.

The weather here is famous ship, the ss Great Britain, standard since the majority of the majority of the standard since the majority of the majority of the second since the majority of the majority of the second since th drawn by students of the school of lengineering degree concertechnical illustration at Bournemouth and Poole College of Art, and is quite remarkable work of chilinsiasin and deillentian by o group of young people.

These expansive illustrations of These expansive illustrations of the old ship, now boing restored at Bristol, have been designed expressly to help visitors understand the enastruction of the vessel. As well as conveying clearly the internal and external features by great detail the designed.

Nielbourne watchdog

and and common teoching errors there is such courses. There is such a serior of a course. There is such a serior of a course, the serior of a course. There is such a serior of a course, the serior of a course. There is such a serior of a course into the self of problems and no evidence ogainst the serior of a course into the self of problems and to offer a course of it is fust such constroints that the such and the types of courses that the three of the serior o

Those professionally interested and those who might be curious to see quite exceptioned work by enthusiastic young students will, I am sure, find a visit to the Science Museum well worth while.

Examination would otherwise have removed touched. A catolague of o touched. A catol

Yours foithfully, S. M. PAINE, Lecturer in charge of technical Yours sincerely, illustration, Bournewouth and Poole College of University Assembly, Melbourne University.

Spatial reasoning

Sir, -- In view of Mr Bernies recent correspondence of Frieducing Mi mi spatial reasoning and the correspondence on this safe, which reference was undersown studies into the problem countries with the spatial page of engineering drawings man permitted to make several detinates. tions. Mr Bermingham's patent.

only serves to confirm a long many colorolismics expin in the tearling of engine drawing, and design to the students, have been awared; some time. Today as our of our mineral man. more overseas students on a convemboral engineering & courses many more lectures; being confronted with mike rlassrount/drawing office me for which they have neight prepared unr entipped to dele

nverseas student popular we meet go no farther than it

lighted by the oversess s. iteciled research loto this age area of entgineering and ne. improve the spatial percept two-dimensional line draws

It has been said that field almost tantamount to list; solution and times believe be oppilostions close on the delos shown. SALARIES Juniese teaching techniques co developed to link culmale otherwise sisted) see se tollow Senior Lecturer, \$A17,785 to 1A22,018 ; Lociuror \$A13,550 to \$A10,358. Fmihor delelle. those of our engineering tions. The critical factor andillogne to engillane replant for inversess studen each pool, molhod of application and application entennections degree coassi Saned Karaban, is time. oim, where applicable, may b term, where appropriate, may be chicked from the Association of Commonwacith Universities (Appointments), 38 Gordon Squaro, London WC1H OPF. Cenerally their endesire learning surpasses that of

British connecearts lan delica in crosing-ring background a the made on overnight has, traffer these students that tron courses in "sugments, more alone" are undertaken; to any degree studies.

marbentarical standard of man dents from the Third Wedde there is a simple explanate thin, I predict that the second of Mr Beandingboot's 51665 lang since last any release the hasic principles of esgate production which this comp desperately needs now. Yours faithfully, NEIL DAVIES.

Industrial research associate, he had ment of applied saching

cruss between a loyal op and o toying royal commis

Classified Advertisements

Index to Appointments Vacant, Wanted and other classifications

Appointments vacant Universities Fellowships & Studentships Polytechnics Technical Colleges Colleges and Institutes of Technology Colleges of Education Colleges of Further Education Colleges and Departments of Art Administration Overseas Government Industry Adult Education Librarians General Vacancies

Appointments wanted Other classifications Awards Announcements **Exhibitions** For Sale and Wanted Courses Holidays and Accommodation Typing and Duplicating

UNIVERSITY OF BOTSWAHA

AND SWAZILAND

(University College of Swazils nd)

Applications are invited to post of

LECTURER IN THE

DEPARTMENT OF

CHEMISTRY

Universities



University of Sydnay LECTURER IN

BEHAVIOURAL

SCIENCES IN

MEDICINE

ENGINEERING

LECTURER (Limited Tenure) GEOLOGY

Applications are invited from suitably qualified persons in one or state aspects of Sadimentology. Openiunities for recess of in the Department embrace modern sediment distribution and transport studies and else stratigraphic and openitional environment studies. May 18, 1977.

FRENCH
Applicants chould hold it least a good Honoura degree and a higher degree in French, and should hove obudied in Frence, The appointer will be expected to leach modieval French Linguingo and Lifereiure IIn particular the Athurian and Oreit legende I and Provences Language and Lifereiure; in addition, normal modern language teaching will be required. The successful applicant will be expected to loke up duties on or about January 1, 1978, arts will have opportunities to share in the leaching of both Poes and Honour courses, and to direct positionally be expected to expected to engage the research.

Mey 31, 1877.

MEDICINE

Applications are invited from candidates with postgraduolo feding in one or more of the behavioural sciences [sepacially occlolegy, onlinopolegy or occiming and/or experience in application of their disciplina in fracturing and turbus development of a course in behavioural sciences for medical andergradualos begun in 1874. This position is permanent but may be fitted for three years in the first instance with the possibility of permanency during that time, of in certain cases return force.

April 29, 1577.

BAYERO UNIVERSITY COLLEGE-NIGERIA polications ere trivited in the

LECTURER

LECTURERS/TUTORS in III Mathemotica Education.
(II) Languaga Arie | Auabid, English, French]; (III) Hause and Heire, French]; (III) Hause and Heiser Heinda, Iv) Aluteen and Heiser Heinda, Iv) Spelet Studea.
Ivi) Belance Education | Mathematry, Ivi Belance | Mathematry, Ivi Belance | Mathematry, Ivi Belance | Mathematry, Ivi Belance | Physics | P. 2. Sterling equalpy, IV, IV, Formily Pasagoes, Values ellowance; American | Physics | P. 2. Detailed Spallestone | Physics | Physi

DEPARTMENT OF EDUCATION

for the poets of

RESEARCH AND ... COMMUNITY SERVICES

Detailed applications (2 tidples), including a curriculum vilee and haming 3 rateroes, should be lor-marked by atmell, not later then 16 April, 1977, to the Rogistray Boyato (University Option, Kano, hitgerie, Applicants resident in UK should also send to the high a cour to his view of the Lordon, WIP 907. Further particulars may be determed high allier address.

Oualifications: Oagree in Electrical Engineering with rolevant industrial or research Outles: To contribute to the development of power electronic systems. The appointoe will sloo be expected to pertrepola in the teaching of bests power

University of Melbourna

Limited Tenure

DEPARTMENT OF

LECTURER

ELECTRICAL

IN SEDIMENTOLOGY DEPARTMENT OF

LECTURER DEPARTMENT OF FRENCH

UNIVERSITY OF WESTERN AUSTRALIA Parth FRENCH STUDIES appointment so invited to

Its the Oppartment of French Bitidion. This will be a lem-porary appointment for a period of two years iditally ea from August, 1977, or ac seon as cossible the sellar. Candidates The appointed will be encouc-aged to love responsibility to Auguol, 1977, or ac soon as posoble the earles. Candidetos ehould hold e doclorate or have equivolent qualifications and experies. The appointee will be expected to loach broadly in the usual lisids of Fronch language and Horstone from 1809, but preference may be given to a specialish in nikeleonith century French literature, The possibility also sixtle for an oppolyment on accondment or at a visiting lecturer on Accollable tarma. The current salary range for a Lacturer is \$A13,850-\$A18,359 p.a. An appolishe tarma. The current salary range for a Lacturer is \$A13,850-\$A18,359 p.a. An appolishe tarma. The current salary range for a lacturer is \$A13,850-\$A18,359 p.a. An appolishe appointed for loss for self aed fully dependent tarmity and removal allow-ance, and to similar tapatration benefits on completion of law years of service. Applications in duplicate staling full potomal perticular, qualifications on despeilence, should sach the Stalling Officer, university of Western Australia. Nedjands, Ketlern Australia. Nedjands, Wetlern Australia. Nedjands, Wetlern Australia. Nedjands should taquest ince to the Stalling Officer. agod to love responsemy of eveloping and teaching occuses in Merkaling Management and in more specialized advenced floke. Expetites in the liaid of consumet hehoviour would be an advantage but is not escapital. The successive applicant will be an advantage but is not escapital. The successive applicant will be encouraged to participate in Management of research and will be encouraged to participate in Management of the successive application of the university togolists with conditions of appointment and of the university togolist with conditions of appointment and of the university togolist with conditions of appointment and for the university togolist with conditions of appointment and information of complete the successive application of components of the university to obtained from the Association of Components of the successive application of the university of the successive application applicat

Further particulars and application forms are available from: The Steff Officer Heriot-Wett University

Chombars Streat, Ediabutgh EH1 1HX to whom completed forms must be returned by 22nd April 1977.

UNIVERSITY OF DUBLIN

EOINBURGH COLLEGE OF ART

Applications are invited for the post of Professor

and Haad of the Department of Architectors.

HERIOT-WATT UNIVERSITY

Professor of Architecture

## Trinity College **CHAIR OF TEACHER EDUCATION**

A second Chair of Education is being established. The person oppointed will head a new department and be responsible for the education of primary

Persons interested should write for further particu-Tha Sacrefery. Wast Theetre, Trinlly College, Dublin 2

to whom applications should be sent, prefcrably before Friday, April 22, 1977,

THE UNIVERSITY MASSEY UNIVERSITY UNIVERSITY LIBRADY elmeraton North, New Zealand PROGRAMME OF CATALOGUE Daparlment of Markeling SENIOR LECTURER/ LECTURER IN MARKETING Applications are invited for the above-meritioned Leotusehip in the Department of Marketing. Applicants should have substential experience in loaching and/or practicaling Marketing Marketing ment. The applicate will join at staff of etc. In the Department and with the Market Research Centra, which has a staff of exon.

Acolications are invited for the posis of RESEARCH Fel-Low and ANALYST/PRO-CILAMANER on the fellowing projects Husened by the Brillsh Library of Catelogue data for local use.

Ith An Investigation of the proubles of select access to the select acces ME UNIVERSITY

RESEARCH OFFICER STATISTICAL, COMPUTATION Applications are in vited. THE UNIVERSITY OF JUBA-SUDAN

Applications are mysted for

PUBLIC **ADMINISTRATION AND** MANAGEMENT STUDIES

These we the first posts to be calabilisted in this sew institu-tion. Toaching will begin in September 1977. Appending a public of the second series of Pro-level within the grades of Pro-lessor. Reads. Senter calure of Locture. Professor with the given to candidots suitably quali-tied for the more senter appointments.

given to candidous suitably qualilied for the nicre senior spooniments.

Applicents should have good
degres(s) in public saministstion, working oxpertescs in
centsi or local government in
a developing country and special
interests in organisatios sno the
covelopment lechsiques in the
public sector would be desirable
additional qualifications.

Outlies will include leaching
overview and beade cources in
administration, politics and logal
system in Buden within an integrated first-yes social actesce
programme and designing programme for the development of
administrative and managoment
studies to which it is intered to
alve grominence in the College
of Economio and Social Buddes'
sclivities. Some service seaching
in the monogement field for
other Colleges is enviceged. A
knowledge of business administraiton and law would also be
usefur.

Anowledge of business edministraiton sind law would clso be
usefut.
Salsiy scalso [under isview):
Profassor £54.135 p.a. Resder
£33.629 p.a. Senfor Lectures
£32.685.£53,000 p.a. Lectures
£32.685.£53,000 p.a. (£1 alerling
æ£30.53). The stifligh Overnmont may supplament salaries in
range £2,085.£3,800 p.a. chailing I for
cl 1,410-£1,880 p.a. (stailing I for
college appointed applications
cl 2,000-£1,880 p.a.
copies including e curriculum
vities and naming 3 claresa.
should size and 1 for
secrotary Generel, Juba University, P.O. Ros 221/1, Khartoum,
Rudan. Applicania losideni in
U.K. should size and 1 conder
vities than 18 April 1977, to the
Secrotary Generel, Juba University, P.O. Ros 221/1, Khartoum,
Rudan. Applicania losideni in
U.K. should size and 1 conder
vities university Councit, 00/91
Totlenham Count Rosd, London
vities delicated inom allihat
addresa.

ABERDEEN

THE UNIVERSITY

TEMPORARY LECTURESHIP IN ECONOMIC HISTORY

Applications are invited for Experience Lectureshin in Experience Lectureshin in Experience Lectureshin in Experience Lectureshin in Language Lectureshin Lectureshin Inc. Language Lectureshing Lecture

Salary on arale £3,753 to £5,665, with appropriate

THE UNIVERSITY

LECTURER IN

Applications are invited for the above, took, the first re-somability of which is for teaching accepting in the inter-disciplinary School of Human Purposes and Communication.

de es es per en pin. Euger.

Futher well-tilled all application forms of the personal application forms of the personal application of the pers

Cendideios should hold a Ph.O. ond specialize in Physical Ciremiotry. Inorganio at Gogenia Chemiotry qualifications will also be considered. The appointed will teach the life in the special of the considered of the special of the considered of the special of the considered of the special of special of the BIRMINGHAM THE UNIVERSITY DEFAUTMENT OF FRENCH

BRADFORD THE UNIVERSITY MANAGEMENT CENTRE

Purther desite spelication form obtains his from the living from the living true. (187) and the living true of the living true

Abbitacione ere invited the appointment to dan above poats, which invited overlapment work, leaching, and administration on part of the management control of the management control of the management of propriations of control of the management of propriations and the public occion and the public occion and control of the management of marketing field are realized together with practical experience of management and an appear of management and an appear of management and an appear of management and acceptance of the control of the co Balari within lecturer scales:
£3,535 to £6,555 per annum
or at Senior Lecturer 1000 to
within scale £6,443 to £7,951
per annum, supersimusble...



READING

THE UNIVERSITY

TEMPORARY LECTURESHIP
IN LABILISH

Studentships

CAMSRIDGE

BRADFORD

6.8. n.c. nesearch Bruppintshins In Sociolouy

8.8.n.c. BEBRACCI OTUDENTERIE

University Parth, Wealern Australia

Murdoch

Murdock University, Wostern Aus Mundoch University, Wostern Australia's second university, adminad in Itral audents in February, 1976. The University is committed in Jahma of fresh appreach to higher aducation, with the goal of reasending directly is the conditions and needs at the conditions and needs at the transition century. This is relacted in edmission catteries, organisation arructures, programmes of aludy, philosophies of tassing and recruimment of staff. The University is organized on a system of achoes of cludy, with the Osan at each adminds administrative and administrative

ayarent of actions and each action having the Osan at each action having beth occudents and administrative respectively qualitied persons for the following positions which ere to be taken up in January, 1978, or as soon thereafter go possible:— SCHOOL OF EOUCATION

LECTURER/SENIOR LECTURER In EDUCATION (Educational Psychology) that EN 0227)

(Raf. EN 6227)
Applicants should be qualified in both paychetogy and education. Experience and research in the general areas of alther aducational psychology or appeled education, with special emphasia eleming and human dovalenment, would be destrable. Outles will include lasoling psychology to undergraduate and pagervision of pagerduate research students in edirectios, and supervision of pagerduate research students.

LECTURER IN EDUCATION (Curriculum)

(Curriculum)
(nai. EN 6444)
Praisrance will be given to applicants with a strong background in curriculum theory and devolopment and teaching experience in a major area evolution and teaching and result include under a comparation of the control of the control

purchass achemo. Precedura for Applications: There is no praecribed application form, but TWO COMPLETE BETS of detailed applications, quoling iorm, but two complete actions of detailed applications, quoting the appropriate reference flumber, including full probabil particulars, details of torilary quelifications, carego history with description of posts held, area at special competence and interact, research complete or outlookly being underfaken, personal views on teaching, membership, of professional insistation or social professional control of the competence material published by the applicant, when svalable to lake up appointment it effered and the names and addresses of three professional referoes should reach the Personnel Officer, Murdech University, Murdoof, Vastiarn Australia, 8163, by April 28, 1977.

Applicants should regress the write immediately, qualing the appropriate saferonce number to the Pernonnel Officer, Murdoch University.

The Pernomen Uniter, Murdot University.

Applicants resident in the United Kingtom, Europe or Africa at the 11ms of application should sloe forward ONE further odpy to the Association of Commonwealth Universities (Apris.), 30 Oordon Squara, EONDON, WCIH OPF, from whom conditions of constitutions of the Association of Common-square for the Common of t

University of Wales 

ADMINISTRATION ACCOUNTANCY

Requests (quoting Réf. THES) for details and application form to Personnel Section cedenic) UWIST, Cardiff BAYERO UNIVERSITY COLLEGE-NIGERIA

ppiications are invited in the DEPARTMENT OF ECONOMICS the fallowing posts:

(a) PROFESSOR. Condidate ahanid held e Ph.O. have abvarat years' leaching ax-perience and the ability to initiate and develop re-agaron projects.

(b) SENIOR LECTURER. c. JAMON LLC Istillacen
dideles inuel hold a Master à degree, have al less
tive years tesching experiouse end the ability it
initiele end davelap re
search prejects.

(c) LECTURER. Gandidalea e hould have n higher degree and at lepst thes years leasting enpatience. Salary acales | 1a) Mil.289-Ni2.426 p.a. | (20.830-210.615 p.a. | 120.830-210.615 p.a. | 12 a grar, rising by four autous increments to £4.485.

further information and application forms may be uplained from the Secretary the plained from the Secretary the Indian the Applications of Art. I Secretary in Art. I Secretary of Art. I Secretary and The Applications of East Price of East Price (ES) 1PX.

Applications noothor with curriculus that one of the annual feature of the Indian that are of the Indian that annual in the Indian that I was a support of the I regnistion of salatica for marriad expensions to poste (a) and (b) in range £2,160-£2,982 p.a. (signing) er for eller for part (b) and a 22,80-£2,982 p.a. (signing) formally free of eller for an augusty roviewed annually end provision of children anduculars allowances and holiday viali passapse. This supplementation will not apply to single appointant to apply to single appointant a Pratessorial lavel or to sny appetitions to Lecturer lovel. Family passages; valuus alluwances, suparasmusticu occurrent overses to suparasmusticu occurrent occurrent overses to suparasmusticu occurrent occur

Ostalind applications (2 capica), including a curriculum vilsa and naning 3 referees, ahauld be forwarded by eirmelf, not later then 15 April, 1977, to the Register. Beyere University Cellage, Kana, Nigeria, Applicants rasident in UK should also sond 1 capy to infer-University Cornell, So/91 Tollanham Court Head London, WtP 007. Father particulars may be obtained from either address.

**BAYERO UNIVERSITY** COLLEGE—NIGERIA

**FACULTY OF** TECHNOLOGY for the post of PROFESSOR AND **DEAN OF THE FACULTY** 

Candidates should hold a Ph.O. (preferebly in Civil Enginoeting), experience in leaching, tesceroit and curiculum development, axperience in premints a how foculty of Engineering, self dovalepment and recruiment. Femilierity with the problems of lechnical oducation in a fibrid world ceunity is ossential. The Osan will be respensible for developing a training prepramms for engineers. He should have a broad oducation in beckground end cansiders bis knowledge of meny branches of ongineering. Industriel experience would be an advantage. Bailary: N11.288-N12.420 p.a. (19.639-219.616 p.s. (eterling) for merriod appointes, (Single Prefeasor will not be eligible for our reviewed ephocity and provision for children education silewance and foliday visit passages. Femily pessages: visit passages. Femily pessages: (2 copies). Including a curriculum vitag and applications (3 copies). Including a curriculum vitag and applications (2 copies). Including a curriculum vitag and applications (3 copies). Including a curriculum vitag and applications (3 copies). Including a curriculum vitag and applications (4 copies). Including a curriculum vitage and applications (4 copies). Including a curriculum vitage and applications (5 copies). Including a curriculum vitage and applications.

Further particulars from: The Clerk of Faculty, Advocains' Ubrare, Edioburgh Eifl 1RP, with whom conficultons must be ledged by 18th April, 1977, Pinesu queig Beterency 3/77. THE UNIVERSITY OFFARTMENT OF ENDIJOIL Applicolons are invined for the post of LLCTRER in ENOLULI LTREATURE. In porson appointed will be required to seek the portion of the post of the post

oce, should be sont by 7 As 1977 to the Register, t versity of fiult. Hull, H 7RX, from when further t ilculars may be obtained.

THE UNIVERSITY MANAUENENT CENTILE LECTURE8HIP IN PRODUCTION MANAGEMENT Candidates should hold deed honours deares in aclance or rechnetors and ideally a post-graduate measurement publication, experience an oroduction, experience an oroduction, experience an oroduction, experience and control of the profile of the pr

1100 1 00 101

Salary within scoto 5.537

Applications are invited for this post in the post-inhalt of Acronaling and Principal of Acronaling and Principal of Acronaling and Principal of Acronaling and Principal of Americania Enthor Particulors And Supplication forms as nosables of the property of the p

·华克兰大学经验。

BUCKINGHAM UNIVERSITY COLLEGE TWO LECTURESHIPS IN LAY tra ciron Puly 1977; lo medalize is fax Law. Other fon July or Orlober. Public sierational Law in advange on the Color in the Color in

Particulars train Hogistrat.
Ut:B, MK18 (LG.

CAMBRIDGE

CAPE TOWN

THE UNIVERSITY

LECTURESHIP IN ENRLISH

Applications are invited for the above post, vacant an front January I. 1978. Appendi-ment, incoording to qualifira-tions and cyperioure, will be read to the matter portion 16, 30d by 1830ff applicability per unany. Teld a nonalogability per unany. Teld a nonalogability baste salury.

per unatur. The upper cent of basis of the per of the p

Algorithm Conferming the position and noneal confittions of service strough the obliming from the testing of the conferming of the conferming of the conferming of the conferming the whom opidicallong must be received not toler than they do, 1977.

DURIJAM

THE UNIVERSETTY

AOMINISTRATIVE ASSISTAN BT. AINAN B COLLEGE

Further particulars from his principal, 81, Aidan'n Lollego, buthon Dilk 3.1., lo whom opalications (liure copies), with the newes of two referoes, should be cont, by April 9.

EDINBURGH

THE UNIVERSITY

CHAIR OF SCOTS LAW

The above Chair is vecent, and the Faculty of Advectors is required by statute to another two peccens qualified to occupy the Claur.

The Professor fo responsible for leaching responsible for leaching in the Bennius and section of Scots Law. The agnolishment of the line, Select not less than \$8,306 per annum.

PEPARTMENT OF ADDIT NESCAUCH POST IN ARREST LOUCATION HESEARCH ASSISTANT. 10

IFESTANCII ASSISTANV. IO work in the Industrial Studies Unit of the Dopartment. The work will ontail towarts little work will ontail towarts to the doveloping programme of Irabe union day rategue robress towards with lord Irabe union will be interested to the operation will lord little will be involved, and there will be involved in the involved in the

THE UNIVERSITY OF LUCCE

I.CC IDR in BN(II.ISII 10-paired November, 1977, Appli-cents - should have Honous Heyree, with Postpraducte qualification or University toxehing experience. Monthly astnry 220,000 lire. Curriculum vilso with references aliquid be addressed to the Otterius, majimto di Limpo Siranjore, Facollo di Magistero, l'injversità di Locre,

> KEBLE THE UNIVERSITY

Applications invited for Lec-brechip in Criminology will in Copertmont of Laty, Lupid qua-litications not required, interest in statistics and for research noticed welrome, Salary of Lecturer Bealo 23, 33, 10 54, 635 per annum, initial plac-ing depending on ope and ox-perience. Application forem and fur-tion particulars from the items-trar. The University. Keele, Brotta., BTB dikti, in whose completed forms about be re-jurned by April 30, 1977.

KENT THE UNIVERSITY Cantorbury LVCALLA OL BOCIVE

TELIPORANY LECTURESHIN IN INTERDIBETPLINARY BLUDBS Annicotions are invited for a two-year lumphracy lacturestin in interfectulings. Buddes to teach a course, deviced by liver and course, deviced by lacture and liver a course, and liver a course, but liver a course, but liver a course, and liver a course of introduction of the course of

The appointment will be from tel Ocipher, 1977, or realier if this is appropriate. Salary will be on the scale £3,253 to £6,600. further nariculars and application for any may be obtained from Mc. J. E. Helliy, Assistant Hogistrac, I. Jornwalls (Inlighto, The University, Logiorbury, Koni, Comulated application in the contest should be jolurned and listy than Nonday, 4lli April 1817, Thun Plogs quote reference A. 77

LEROS THE" UNIVERSITY OPPAIITMENT OF PLANT

Anplications are invited for the CHAIR of CHOP SCIENCIL variation by the restaustion of Presidency P. H. Timker Applications will be welroned in crop chysical will be welroned in crop chysical will allow a fine company and science which related to crop preguring. The related to crop preguring the related to crop preguring the related to crop preguring. The related to crop preguring the related to crop preguring the related to crop preguring the related to crop reducing the related with the pregured with the pregure of the related with the relation of the related to the related with the relation of the related to the related with the relation of the related to the related with the relation of the related to the related with the relation of the related to the rel

NOTTENCHAM THE UNIVERSITY ABSISTANT NEGISTHAN Applications ore invited for thin appointment wide; will involve responsibility in the fields of coremonial, examing, and conjections. The appointment will be affective from 1st June, 1977 or as soon as massible thereafter and will be with the Application.

Further details and forms of condication, told name in the condication of the condication

Some States Bearing

MANCHESTER
THE UNIVERSEL INSTITUTE OF SCIENCE AND TECHNISCOSY CORRESION AUD PROTECTION CLATER PRET-DISCIONAL APPOINTMENTS

Applications are invited for a Turnportry Lactureship for two years in Indian Lifety years in Indian Lifety Learning and the Control of the C Applications are invited from occiding for engineers of children for engineers of the following special formation of the following special for work admission for the following special formation for particular mating of the following special formation for particular mating of the following special formation for particular mating only and Auger special formation formation formation for the following special formation formation formation formation for the following special for the following special formation for the following special for the following special formation for the following special for the following special formation for the interesting and Auter Mottre-gropy: the survey and experi-mental stidy of correction prob-lems to auterniture. Previous released survey is decirable but other point anotherne will be on Runne and Carlotte will be on Runne of A C.5.75 to C.1627, with startium salary not exceeding \$2.701. 1A C. 1515 III and C. 1516 A C. 1516 III and C. I Fellowships and

CAMSRIDGE
THE UNIVERSITY
DUPARTMENT OF COUCATION
S.S.H.G. STUOGNISHIPP
SUILably quotified embasis
in including in pursue reserve
in terioder 1, 1977, in
1977, overs in the irrai insisted
i train of the prepartment
of Education 17 Trainplague
of refereds, and a brid fallenont of regressed the security
in contribution of the prepartment
of refereds, and a brid fallenont of regressed the security
income of refereds and a brid fallenont of regressed the security
in contribution of the security
in contribution of the security
in the security in the security
in the security in the security in the security
in the security in the security in the security
in the security in the security in the security in the security
in the security in the securit NOTTINGHAM THE UNIVERSITY MEDICAL OCHOOL OFPAILINENT OF POST-OOCTOHAL DESEARCH

Applications are invited for a research tellawship linas ed by an industrial company of a study of the company of the company

Applications ore laying a party of possible from case duties holding or easying to obtain this summer a tird or uniform excond class shooms degree in Strictely for two year studentishing commencing October, 1977.

Euriher defails and application forms from Mr. 6. k. Littlejohn, Postgradus School Goods Octobers, University of Books Octobers, University of Books Octobers, University of Books Octobers, University of Books Octobers, University of Living Inc., University of Books Octobers, Postgradus Volume 101. SOUTHAMPTON THE UNIVINSITY AND YIGHATION HESCARCIL Agnications are invited for a three-year oppointment of Ten-norary Lociutor in the fusil-luio of Bound and Vibration Research. EOINBURGE OPPANIMENT OF ARTIFICUL

Candidates should have pent-decloral experience and re-nearch inferests in applied salary within lower peri of scale \$3,535 to £6,555 ner ennian. Initial salary will drawn and asperience, turtier particular long on the second of the second

THAILANO

THE ASIAN INSTITUTE OF

Applications are invited from Australian ritizons for the faculty partitions in the following folds:

APPLICD MATHEMATICS

ENGINEERING CCONG-

Appointments evaliable of satisfied, needed with all receive ronditions and needed with all receive ronditions and needed of conditions on the politics satisfied to build the received to require the received postgradus to condition to the received postgradus to condition of the postgradus of the postgradus. Another the postgradus of the postgr

me of their.

January of Linny.

The A.T.T. on solidated in 1908, is situated in Taloland on 400 orre commus 431 km on 400 orre commus 431 km orresponding to the solidated in 1908 of Banghot, The Institute in an interpolation of Banghot, and solidated in the solidate in the solidate

Applications, quoting Rof. A2.77; ead including curriculum vitoe and the manes and addresses, of three references should be sent to the Vice-President and Provest, A.17. P.O. Box 2731, Bangkek, Thailand.

Parameter and a second property of the second

Annications for as unmarked 8.8.8.C. Research 18.8.8.C. Research 18.8.8.C. Research 18.8.8.C. Research 18.8.8.C. Research 18.8.C. Research 18. SALFORD THE UNIVERSITY
PHYSICAL BUILDATION
SECTION LECTURESHIP nbisined by letter of Arines Rowe, Department of Arines Intelligence, University of Edinburgh, Parrest Hill, Edin burgh, EH1 201.

Applications are invited for the post of activity in 1919 to 1 THE UNIVERSITY PROCTER OFFARMENT OF M.BC. STUDENTSILIP D FIDO ENLINEERINO/ FOOO BCIENCE mnos 10 Physical Eduration
1061-736 0843, extension
1061-736 0843, extension
7228), such that the ceptor
23.7.3 to 26.665 USS F8SH,
Further norticulors and could
room the front provided and could
from the foliated of the could
be reconciled of the could
the first considered of the could
be reconciled of the could
provided of the could
1477, not less reference number
PE/23/THES. Applications are invited from still ably questiffed U.S. Horogers producted to understood 12-month course starting in Dictator, 1077, leading as M. Sc. degree rither in Food Engineering or in Food Incidence.

Beinge, The University, Leg UT. 182 UT. 190 per legislation of the frosportive candidates that submit in durification deciding of the frosportive of the frosportive of the first than a frosp

MIODLESSX SHUNCL UNIVERSITY DEPARTMENT OF GUADUATE STODIES ! M.Phill. AND Hh.O. CEOR

THE UNIVERSELY REBUILD STUDENTS IN BOLL IN BOLL IL Apprications are inside the little two states and inside the state

THE TIMES HIGHER EDUCATION SUPPLEMENT 25.3.77

MODERATE TO THE WORLD MENTER HOLDERS HE WAS A STREET WAS

olytechnics

PLYMOUTH POLYTECHNIC

lecturers are required for new posts in these disciplines. School of Management and Business Studies

ACCOUNTANCY MARKETING 2 pasig et Lif, St or PL\* LII or SL\* pullty to lasch Law would be an ability in toach Economics would describe for one of these poals. bu holpful though not assential. School of Mathemetical Sciences MATHEMATICS .

2 posts at LII leach as a wide range of courses throughout the Polytectinia. School of Behavioural Saleries : and Societ Sciences

PL £5,94P-£7,578 8L £5,931-£6,417 LII £3,P7P-£5,4P3 SOCIOLOGY

picalions are invited from qualified personnal with relevent professions of leaching experience.

Drake Circus, Plymorith, Devon, PL4 BAA

**Assistant, Overseas Centre** 

£2.724 to £3,126 This is a new peal in a developing area and will be based at the Berking Precinct, Longbridge Raad, Osgenham, Essa. Ha/she will sealst the Oversase Listeen Olitical arranging stadent placoments both abread and in Grifain; develop, moniter and assist with the organisation of the oversace activities of NELP and provide a small arranging excellent course. Applicants afround be sole to work on their own initiality, be compotent shorthered typics and oreferably have a knowledge of Franch (Cerman and/er Italian would be sit added advantage).

advantage).

The asiary will be within the inclusive snausi scale quoted depending on age, quelifications and experience.

If interested please contect the Personnel Office, 199 The Grove, Stratford E16 (Tel 01-655 0811, Ext 32), queling reference A313/77 for further defails and an application



BRISTOL POLYTECHNIC Department of Construction & Environmental Health

PRINCIPAL LECTURER IN **ENVIRONMENTAL HEALTH** 

Applications ere invited for the above post. . . . . Candidatee ahould be greduetes in Environmental Health or a releted disolpline, with eppropriate professional qualifications and experience.

The successful expenence.

The successful candidele will be expected to pley elegating role in the development of e degree course in Environmental Health. Previous teaching experience et this level is, therefore, essential,

his solility to contribute to research in the depertment would be edventegeoue. Salary Scele. Principal Lecturer 25,940-26,642 (bar)-17,578 plus £312 supplement.

Further details and application forms (to be returned by 8 April; 1977) to Personnel Office, Bristol Polytechnic, Colcherbour Lene, Bristol BS16 1QY. Pleess quote Post Reference Number L63/111 in all communications.

PLYMOUTH POLYTECHNIC

School of Behavloural and Social Science LECTURER II

POLITICS PUBLIC ADMINISTRATIONS

HUNIC ADMINISTRATION:

Mariy 23,279-25,493 p.m.

(\*2312 p.e. auppierment)

Marking and developing a

met of concess, including BSc

(white Sindles, BA Social

Mary and Administration, and the

model of the concess of

hisresis and expertise in Administration, Policy Ann-te Comparative Public Adminiinitian in the part of the remed by 15th April 1977 ran in distinct with further particular the Personni Officer.

BRIGHTON: POLYTECHNIC' EDUCATIONAL DEVELOPMENT UNIT

GRAPHIC/ **PHOTOGRAPHIC** DESIGNER 22,781 to 25,805

Roquired 10 work with a feam providing a wide range of edupellonal development sorvices to 
academic staff, end with apecitic responsibility for a cantral 
graphic, photographid and reprographic service; Ability and excerience in designing and producing graphic, photographic 
majorists for teaching and producing graphic, photographic 
majorists for teaching and legining secantici. neutrage for tagering and regim-ing cotantial.

Further dolatie and application:
ferme from Parsonnel Division.
errighton: Polyteuthic, Moulae-coomb, Brighton 6N2 4GJ. Tale-phone 692855. Closing date
Acril 6, 1977. BIGGUTON

DEPARTMENT OF COMMITMENT OF LUNORAN STOUR SENIOR LECATORRE IN LIGHT 1911 AS A TIBERTIN LANGUAGE TO CONTROL OF THE PROPERTY OF THE PROPER

HATFIELD HIII PULYTRORNIG MACHABLE 2, in POLITICS. offer 8395

An honoring GHAMDATT with an illustral in Filher comparative politics of the politics of each observable politics and each observable politics and each introduction and observable politics and each introduction for the politics and each observable politics. DOLLCY BUCKE

·Rof : 8301 . Applicants should passes a your honours degree with a simultania social pulley remperential. There is seen for dover yourself in the same for dover yourself in sector policy. For bith pulls profesore will be obtained by the same experiance of degree my such that with a lighter degree my social to the pulley of the pulley o

> I.DNDON CITY OF LONDON

A vacancy exists in this well enishtished department, whose work includes comers for an MSE in Annicola Mathematica and it by, clone, in Mathematica Series on the passification of Applied Applicable Mathematics, and the passification of the ECONOMICS AND BANKING BLUINE TECAMECIE IN Applications are invited from graduates in Leanonates. Business and the state of th Balary: Lecturer II Srutor Lecturer; A5,27°1 by £21°1 in £5,001 veliciency barr by £21°1 in £5,001 veliciency barr by £2.1°1 in £6,001 by £2.1°1 b

An interchant task will be in usaksi with like guinthistration and active invelopment in day part sevening courses for bankers, sevening courses for usakets and in a course for the course of the cou OISPANTMENT OF LISTAL The salety tode, in according to the control of the

liculifod frint 1st September to least in the B.A. Law bearse courses tuilibling and bearse courses. Intilibling and but interested in other dures but interested in other dures and interested in the second bearses when the second by the second bearses and september dearer and september dearer or protessional reality careful will be on seventess. Sulvey Senie Funder politions, S.L. £5.031 tu £5.455 (ber) in £6.417 plus \$532 supplement L.H. £5.279 to £5.493 plus £312 supplement. LONDON B.E.18 THAMES POLYTECHNIC Abulication forms and the hard hard from The Establishment Officer, The Phytosphic, "Reliverhamition," W. U.V. BUSIONL OF NATHEMATICS

COMPUTER ACIENTIST A vareacy exists for a LEC-TIDEU II in the Division of System, Annuyels but the ner-son APPOINTED may be a spende didillonelly, to the Div-sion of Commuting and Nomer-cal Mathematics necording to bln nuclifications and exect-oren. Colleges of Further Education ench.
The Civisions are part of the School of Mathematics, Sistia-lice and Computing, which runs several degree and digions courses, legituding a 1.5c.

neveral deachs and delons course, holisting a B.Sc. if procurs in highling a B.Sc. if procurs in the course of the LONDON INNER LONDON EDUCATION SDUTH WEST LONGON Tuoling Brondway, 8, W. 17 Noguired from 1st Goglem-bor. 1977. Lail doir Egg-TURCIE; trode is abroiding of it self-sures or in-AnAOS-NEAT STUDIES is leach to 8 hours per weak and ourned the balance or hyurn to aci as the Academic Personal Assis-ient to the Principal. , Salory actio: Lecturer Brade it 45.593 to 86.367 gross in-clusive.

MANCHIRETER THE POLYTECHNIO HOLLINGS FACULTY Asialanca may be civen le-words hemanical removal ox-pensas. Further deinig and forms of sonlicular returnable vithin 1A days from Santar Administrative Officer, South West London Cofficer, South West London Cofficer, South Insugues, London W137, 17341 DPPARTMENT OF CLOTHING OUTION AND TECHNOLOGY LECTUDER II IN CLOTHING The person oppointed will join a form leading or course, seeding to course, leading or course, leading to the leading of the l A Cicilian mullith, or equivalent publication and some verse experience in producted frame and are destrible qualifications.

Sainty schot, 25,270-28,494, hits \$332 inc. annuin supinoment. "

For application form relumble by 12th April 1977, please solid a polysterise and volume form RO.4 to the Surrelpry, Munchester Polytochile, Lower Dymand Gircel, Munchester All 5 68%.

Adult Education

CUALIFIED ESTIENT necked South Rost London part-time tailernoons, ILLA raios. raios. Amily GCRA, Old Town [43]. Palyirclude - Sirkey - B.E.18. Telephons : 91-855 7141.

Electrical and the control of the state of t

SHEEFIGED

THY POLYTECHNIC

DIPARTMENT OF APPEILUMENT STUDIES

SENTOR LUCTURER IN ADMILLO SOLIAL STUDIES: SOCIAL WORK

Anothesiting are invited for this senter past in the Unjuriant appetitude a protect Appetitude a protect Appetitude a protect Appetitude a protect and the sentence of the sen

ordion is an important re-pull remone. Salar Sa

SUNGERLAND

THE POLYFLORING.

FACULTY OF ART AND DEBION

STUDIO DEMONSTRATUIC IN PRINTMAKING

control of change Tils one year appointment offerlive from September 1977.

Online include it hours to-ching with access to studio Lectifica maring tions or oriods outside of tearning tours. An against along tours was to aliance from the Personnel Olliver, Sunderland Polyterh-nit, Chester Rund, Sanderland 84ti 380, and should be re-immed as noun an possible.

TEES31DE

THE BOLY LEGUNIC

DEPARTMENT OF MATHEMATICS AND STATISTICS

LEGIUMEN IL SERIOR

WOLVERHAMPTON ...

THE POLYTECHNIC

SENIOR LECTURERA

Colleges of Art

CHARLES THE THE TAXABLE PROPERTY. What has to copy and against conduction to a constraint for conduction of a sold and

Chelsea School of Art Manresa Road, SW3 6LG

Head of Department of Graphic Design

The governors wish to appoint a Head of Department of Grephic Design in succession to Mr Edward Wright.

The past will become vacant on September 1, 1977. Applicants should preferably have had wide experience as practising Graphic Designers and have contributed to Craphic Design advention at a high level. Graphic Design education at a high level.

The department offers a ll.A.(Hors.) degree level course of three years' thrution and at present enrols 20 students

Salary within the scale £6,231-£7,023 plus £312 supplement and timer London allowance of £402.

Further particulars and application forms from the Sentor Administrative Officer, Chetra School of Art, Manresa Road, SW3 61.8, repartable within 14 days of the publication of this

大学的大学、中央の大学の大学大学、大学の学の大学の大学の大学を大学の大学 

Colleges of Higher Education

SOUTH GLANICALEAN

SOUTH THE TOTAL THE SOUTH AND THE STATE OF THE SOUTH AND DESIGN

PERSONAL THE STATE OF AND DESIGN

PERSONAL THE STATE OF THE STAT SOUTH GLAMOTEAN

Wanted ' TEACHER/LECTURER

Appointments

Colleges and

Institutes of

DONCASTER
FIRMEASTER METHOPOLITAN
INSTITUTE OF THEFTER
EDUCATION

DEPARTMENT OF RELENTA

ANT MATIGMATICS 79-43 Industried as soon as possible, a Liftylliki in the modern and instruction of the sound of the sound

23,277 pion E312 supprement.
Placing on this scale is
dependent on quelification end
oxogrisance,
Ploaga and a stampoul acpresson onvolope for englishtion forms which are obtaintion forms which are obtainblu from the Principal, Dencaster Mellosofitan haditude of
linter Caucation, Waterdale,
Doncaster DN1 MEX.

Technology

REMINDER Copy for Classilled Advertisements in the THES should arrive not leter than 10.30 am Mondey preceding the date of publication

Courses

University of Weles اداسا

DEGREE OF M.Ed. TEACHING OF ENGLISH Edition AS Array FOREIGN LANGUAGE

(Jointly with University College, Carditi) Applications: era invited from graduales with eppro-priale teaching qualifica-tione and/or experience for edmission in October, 1977, to e one-year or lwo-year course leading to the ebove-mentioned award of the University of Wales.

The course will include the The course will include the Teaching of English as a Foreign Language (phonetica, linguislica, melhodology), and a topic in Educelion (ina latier studied at UCC, Cerdill). Cendidate will take is written exemination, and submit a dissertation.

Further delette mey be soteined from the Acade-mic Registier, UWIST, Car-gill CF1 3NU. 

. AT THE IIATTIBLD POLYTECHNIC

COMPUTER EDUCATION

A lwo year harf-lime course seeigned det learning and det learning and det learning and determine the seeing and determine the seeing of conjuncting or in the use of incomputor as a loseing and the course required single and overling and a learning and overling and Fucther details from . School 

MIDDLISSEX BRUNGE ENTYPHAIRY

TART.TIME POSTORADIATE The Disperiment offers a two
year course togeless to an M.A.
In Ecocomica, Students are required to otton, Students are
quired to otton
year to otton
year to otton
Application are also mulica for
to the property of the course for
the M.A.

Applicants should have a nool hondura device in transaction. Surface in the property of the state of the stat

LECTURER

**ACCOUNTANCY** Selery :: £3,333 to £6,655

Closing date:

be delicated in the health in hand he was the second

Administration

#### Monitoring Contract For SSRC Open Door Research Scheme

The Social Science Research Council proposes to issue a contract to monitor its new Open Door Re-

search Schame.
The Council has recently issuiched the Open Door
Rosearch Schame for the generation of problem
oriented research proposals in the erea of
management and industrial relations. The object of
the schame is to encourage the identification of
research problems, relevant to their needs, by groups
of menagers, institutions, compenies, trade unlong, and

Advice will be given to those putting up proposals by experienced researchers acting es consultants. The Contract is for the monitoring of these advisory discussions so as to improve the understending of the way in which researchers and precitioners interact, and to report on the progress of the Open Door Research

Applications are therefore being invited from experienced research groups. The Contract will be for up to three years, at a rate to be negotiated. It will include provision for stell costs, travel and subsistence typing, postage, etc. Further information and details of the Open Door

Research Scheme can be obteined from Chris Ceswill, Sacretary of the Menagement and industriel Relations Committee, SSRC, 1 Temple Avenue, London EC4Y OBD (telephone 01-353 5252), to whom written proposels must be sent by 8th April, 1977.

#### OXFORD LOCAL EXAMINATIONS

#### Appointment of Assistant to the Secretaries/Assistant Secretary

The Detegotes Intend to nieke an appaintment, as an addition to the piecant stelf of a porson satisfactly qualitied to deal with rack in the execution of oneign, Technology, Croil and other technical subjects, to begin work on September 1, 1977. All applicants much have graduate or equivolent quotifications; toaching experience is destroble.

The appointment will be made at the level of either Assistant to the Secretary. For expolatment of a Assistant to the Secretary, For expolatment of a Assistant to the Secretary, For expolatment of a Assistant to the Secretary, and the setup sooile, according to age and experience, runs trong 12.904 stang by annual increments as Assistant Sectionary, for which the select gradual content of \$7,087, applicants must be of level 28 years of age. The level: the select setup of a general second and an expellence in the light of the appointment is made will be decided in the light of the applicant must be of level 28 years of age. The level: the select set is the select of the select and the second transition. Graduale star are required to belong to the appropriate superconnuction scheme in operation in the University.

Purities particulars, and forms of application, to be returned by April 18, 1877, may be obtained from the Secretary of Local Examinations, Effect Piece, Summarlawn, Oxford OX2 782.

EQUAL OPPORTUNITIES COMMISSION Princellon Administration Sainty Beals 45,000 to 64,700 plus 6315,20 pay

calions or invited from calions or invited from calified and experion and experion and experion and experion and experion and experion of the experion of the extra of the experion of the extra of the ke over birero selebibne si level elebius o le cons gniwotiel ed i lo ono resoi

athers of which hitter define on an exhibit of the part of the par

SUSCEX

SUSCEX

ASSISTANT SECRETARY
IN THE PROPERTY
IN 100 ADMINISTRATION
ADMINIS

THE OPEN UNIVERSITY AOMINIBIHATIVE ASSISTANT Applications are invited for a post of Adictatisfrative Assistant in the invited at the Assistant Assistant in qualification and Assistant on the individual (1946 1A Scale, 12,904 to \$2,627 per annum. The duties of the post with the related to spectar of the dovolument of the university's policy and practice in the linit of lution. The accessful candidate will be expected to have seen a calling to write the duties of the linit of the linit of the lution of the linit of the lution of the linit of the lution of the lution of the linit of the lution of lution of the lution of lution of the lution of lution of the lution of lution of the lution of lution of the lution of the lution of the lution of lution of the lution of lut

CARDIFF UNIVERSITY COLLEGE

OBPARTMENT OF INCUSTRIAL MANAO ENIENT 8y Examination and

Administration
Applications are tavined from conditates wishing to pursue postered to the product of the produc innutries and applications should be addressed to the strain a missions Officer. The world College, P.O. Box 78. College, P.O. Box 7

Classified Advertisements To advertise in the THES phone John Ladbrook 01-837 1234 THE TIMES

Higher Education | SUPPLEMENT Parker Will SEZ Send

General Vacancies

the College ull (Kum of Ripon & York StJohn

TEMPORARY LECTURESHIPS IN BIOLOGY AND IN PHYSICAL SCIENCES

APPUIN PRYSICAL SCIENCES
Applentions are mented from writing in the Influency comparaty appointments in this I limit of England Voluntary College of Higher Education (1,600 near not woment. The appointments will be from the September 1977 to 3 for August 1978. The College, which was formed in 1978 through the annalogement of the College, Alpon with St. John's College, York, offers course locating to the more of the Colling in Education, the Olphome of the British Association of Occupational Therapisto, the Olphome in Higher Education, the Post-grammin Corillogal in Education, the BEd and DA/BSc (Collegue)

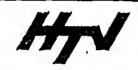
TEMPORARY LECTURER GRADE II

The successful applicant will be expected to teach courses at Honoline degree level. A particular interest in zoology with a bias towards animal physiology and nutrition is required. The appointment will be based mainly on the York campus,

TEMPORARY LECTURER GRADE II (PHYSICAL SCIENCES)

The successful applicant will participate in the teaching of courses in Physics, Physical Sciences and, possibly, Mathemalics which contribute to BA/BSc(Hona) and BEd(Hons) degree programmes. The appointment will be based mainly on the York campus.

The appointments will be at Leatures Gods II scale [\$3,27P plus \$312 to \$5,4P3 plus \$312], Fuither details and application forms may be obtained from The Principal, The College of Tipon and York SI, John, Lard Mayar's Wolk, Yark VO3 7EX, to whom completed application lains should be returned to sister not lains MONOAV, 4th APRIL, 1977.



#### ASSISTANT EDUCATION OFFICER

HTV not only promotes and tollown up independent Tolovision's Schools programmer in the review, but also makes a migrafficant contribution patiently with programmer for intents and brackers from successful applicant will need to have a sound tending byotgowed, and a wide knowledge of aducational decelopments.

For further information and application toral, write to :-- The Paleonnal Officer, HTV Totovialen Cantre, Batt Road, Grisler CSA 1110.

Overseas

# **UNIVERSITY OF MALAWI** THE POLYTECHNIC

A consiltuent College of the University of Majewi, allusted between Blantyre and Limbe, the Polytechnic ceters for approximately 900 day and 1,400 evening class etudents. It offers 3-year full-time post School Cerifficate University Diploma courses in Machenical, Electrical and Construction Engineering, Public Health Inspection, Laboratory Tachnology and Business Studies and a variety of full-time block release and sandwich courses at craft and technicien level under separatio Board of Governors. The axtension of the work in Engineering and Accountency to ordinary degree level nearing and Accountency to ordinary degree lavel is now being considered.

Applications are invited for the post of Principel.
Candidelee should have appropriate coademic untilifications, substantial teaching and administrative expandence and a breedth of interasts appropriate to the range of the Polytachnic's work. The post will carry professoriel status and safety and an ex-officio saat on the Sanate. Salary, £8,110 to £9,735 p.a.

(including a supplement normally tax-frae, psychla by the British Government to clitzens of the U.K., which is reviewed ennually).

Appointment on contract to the University for two years initially, 15-25 per cent terminal gratuity, subsidized housing, free psesages, education allow-ances and children, holiday viait passages, blandials overses, laeve. An interest-free car foan of \$1,200 and appointments grant of £300 ere payable in certain chroumstances.

Presses write for univer details and an application form to Requirement Unit; TETOC, Technical Education and Training Organization for overseas Countries, 36/37 Grosseno Gardens, London Switw April, 1977.

tetoc

Overseas

KELVIN GROVE COLLEGE OF ADVANCED EDUCATION LIRISBANE, AUSTRALIA

Kelvin Carevo Collinge of Advanced Education : nuturance. College specializing is the prepare truncay, Pro School and Soconday teachers. Let tion it offices in with falling of Inservice course. temblinis vitueli mishido a lour-year degree grovetrain 1977. The Cathage everlooks the dig be-positing two kilomotors from its husiness come. So-introlumed in 1977 is approximately 2,000.1 A variancy at the Dapartment of Education will to:

#### LECTURER/SENIOR LECTURER IN CURRICULUM STUDIES

REF. NO. 77/A/8

Lacturing commitments will be predominantly with ers under their inserting the predominantly which ers under their inserting the sorvice diptoma and B.Ed. depart granules. Applicants should have high scademic their and successful tonohing experience. The walful candidate would be expected to contribute makes to course developments within the College and his

The appointment will be made within the leffewing ranges in accordance with qualifications and super Loctmer (t) - \$11,851-\$13,867 per Locturer II

Applications should be received within 21 days

IN W BHOWNLIE, ACTING REGISTRAR

- \$13,850-\$15,925 per: - \$18,314-\$18,389 per: Locturo: I Somor Lacturer II — \$18,794,\$20,170 puri Somor Lecturer t — \$20,828,\$22,010 puri

Application forms and further doleils are system; the Registrar, Kolvin Grove College of Advanced in tion, Victoria Park Road, Kolvin Grove, Brisbans, De-

### **OVERSEAS TEACHING POSTS**

HEAD, EDUCATIONAL TECHNOLOGY ENGINEERING (Iran)

Jumpi Shapur (thiymolty, Aliwaz, Fo colubbish, organish min minage new department to run postpradunte courses inter talor unitergradualy and includent courses. Plib or MSe and at loast 6 years' relevant

expanisher. Salary: £10,750-£10,760 p.s. (approx.). Buriotin: Housing ullowancu; one year confise.

Return lares are peld, Local contract is gunrantoad by the Brillsh Council.

Please wide, briefly sletting qualifications and langth of appropriate experience, qualific released number and title of post for further details and p

THE BRITISH

o The British 65 Davies Street London Wily 24

KELVIN GROVE COLLEGE OF ADVANCED EDUCATION BRISBANE, AUSTRALIA

## LECTURER

BUSINESS STUDIES/COMMERCIAL DEPARTMENT REF. NO. 77/A/3

Applicants should have a strong background in a live of the following areas together with apply academic qualifications and a record of successors in a successors and a record of succ ing experience.

Economies Processing Typayidting Pilman Shorthand

The successful applicant with be required to confer duty at the beginning of July, 1977.

The appointment will be made within one of the wind catery ranges in accordance with qualifications at persence.

perience.

Lecturer III—\$11,851,413,887; per annum
Lecturer II —\$13,854,515,325 per annum
Lecturer I —\$18,314,315,389 per annum
Applications close 31 at Marcis, 1977.

Application forms and further delaits are available
the Registrar, Kelvin Grove College of Advances
tion, Victoria Park Road, Kelvin Grove, Britande, 1888.

Land, 4059.

BIFF MADARTHY, REGISTRAR,

THE TIMES IDGREE EDUCATION SUPPLEMENT 25.3.77

the production of the second state of the second second second second second second second second second second

### UNIVERSITY OF NATAL

Overseas continued

#### Department of Divinity Pietermaritzburg

Applications ere invited from suitably qualified persons for appointment to the post o

### Senior Lecturer in Divinity

The salary scale attached to the post is :

R8,820 by R360 in R9,900 by R450 to R11,250, plus 10 uer cent pensionable allowance per

The commencing salary notch will be dependent on the qualifications and experience of the suc-cessful epplicant. In addition, an onmal vaca-tion savings bonus up to R260 for married men and R130 for women and single men is payable, subject to Treasury regulations.

Application forms, further particulars of the past und information on pension, medical aid, staff hursary, housing loan and subsidy schemes, long leave conditions and travelling expenses on first appointment are obteinable from the Registrar, University of Notal, PO Box 375, Pietermaritzburg, 3200, with whom applications, on the prescribed form, must be loiled not later than April 25, 1977, quoting reference PMB 9/77

**Assistant Translators** 

Brussels or Luxembourg

The Commission of the European Communities is nrganising an open competition on the basis of tests to draw

up a reserve list of Assistant Translators, of Danish, Dutch,

inglish, French, German and Italian to translate texts of a

Candidates, who will be required to translate into noe of these languages (normally their mother languages), should have an extensive knowledge of two of the other languages specified with the following restriction.

(i) Danish, English or German must offer French (ii) French or Italian must offer German

Candidates should be University graduates up to age 35.
Full details and the obligatory official application form are contained in the Official Journal of The European

Communities No. C71 doted 12 Murch 1977 which can be "

4 Cathedrol Road, PO Box 15, Cardiff CFI 1WF

applications 27 April 1977.

The Commission

THE UNIVERSITY OF BERGEN, NORWAY

Lecturer in British Literature

Applications are invited for the post of university lecturer/senior lecturer in British literature in the Department of English; the University of Bergen. The post it vacant in the Department of English; the University of Bergen. The post it vacant brown is August, 1977. The person appointed will be expected to teach up to 10 hours per week, and should have an honours degree in English and teaching experience at university level. Knowledge of Norwegian is desirable, but not a requirement. Salary university level. Knowledge of Norwegian is desirable, but not a requirement. Salary including the property of the property of the property of the position of the property of the proper

Personnel Department. The University of Bergein Bux 25, 5014 Bg & Meridia 15th April 1977.

Facther particulars may be obtained from Professor Harivetts and Department of English. The University of Burgen.

of the European Communities

London W84QQ

Information Othco of The European

7 Alva Street, Edinburgh EH7 4PH Closing date for receipt of completed

legal, economic administrative and technical nature.

Candidates translating into:

(iii) Dutch must offer English.

phrained from

#### UNIVERSITY OF NATAL Department of Accountancy Pietermaritzburg

The salary scale otrached to the post is: R8,820 x 360—R9,900 x 450—R11,250 plus 10 per cent pen-

Chartered Accountants who are engaged full-time

The commencing salary notch will be dependent on the qualifications and/or experience of the successful opplicant. In addition, an unnual vacation savings bonus up to R260 for married men and R130 for women and single men is poyable, subject to Traceure angularization.

and information on pension, medical nid, stuff bursary, housing loan and subsidy echemes, long leave conditions and travelling expenses on first appointment are obtainable from the Registrar, University of Natel, P.O. Box 375, Pictermaritzburg, 3200, with whom spplicatione, on the pre-scribed form, must be lodged not later than May 23, 1977 quoting reference PMB 12/77.

Applications are invited from suitably qualified

#### Senior Lecturer in Accountancy

Applicants need not necessarily he Chartered Accomments but such a qualification shall be an advantage. An interest in quantitative methods will be an additional advantage.

sionable allowaoce per annum. A subvention is payable by the l'ublic Accountants' and Auditors' Board at its discretion to

in lecturing accountancy students at South African

subject to Treasury regulations. Application forms, further particulars of the post

BIHZEIT UNIVERSITY

## "REVIEW OF NEW COURSES" FEATURE

Friday, April 1, 1977 For further details of

John Ladbrook

#### UNIVERSITY OF NATAL Department of German Pietermaritzburg South Africa

Applications are invited from suitably qualified persons for appointment to the posts of

#### Lecturer/Senior Lecturer in German

The salary scales attached to these posts are:

(1) Lecturer: R6,300 x 360—9,180, (ii) Senior Lectureship: R8,820 x 360—9,900 x 450—11,250; plus 10 per cent pensionable allowance per annum. Applicants should indicate whether they ere opplying for the lactureship or senior lectureship or

The commencing salary notch will be dependent on the qualifications and experience of the suc-cessful applicant. In addition, an annual vacation sovings bonus up to K260 for married men and R130 for women und single men is payable, subject to Treasury regulations.

Application forms, further particulors of the post and information on pension, medical aid, staff bursary, housing luan and subsidy schemas, long lenve conditions and travelling expenses on first appointment ore obtainable from the Registrar, University of Naml, P.O. Box 375, Pietermaritzburg, 3200, with whom applications, on the pre-scribed form, must be lodged not later than April 18, 1977 quoting reference PMB 8/77.

General Vacancies

TRAINING STAFF

CAP is Intibly's large;
independent computer consultation of very soon start
in the United Kingdom, Our
present raining is carried out
by a small loam of training
typicalists with assistance from

hing rrupp,
Hain lecturets will gests hain lecturets will gests with noministration of courses but lectured and the second of th

#### Courses continued

BRISTOL

DIR UNIVERSITY

Courses of Advanced Gludy for the Degree of M.A.

Sessian 1977-78

The following and year following and year following and year following and the Milker of FLASHICS, ENGLISH, PRENCIST, GERMAN and TREDICOL and RELIGIOUS STATUS starting in Octabor, LLASHICS;

LAIS Roman Gludies.

Accord and Anaiglion Presidency.

ENGLISH;

Modieval English Liberstore (1000-1400).

# will be published on.

ädvertising :

01-837-1234

Classified Advertisements
To odvertise in the THES pieces
John Ladrocks 01-837, 1214
THE TIMES Higher Education
SUPPLEMENT
Nort Printing House Squares
P.O. Bot 7: Crist's len Road.
Logichi Weix 362

Holidays and Accommodation

GUARANTEED PARADISE "QUARANTEED.

والمرابع والمراب والمناب والمراب والمرابع والمرابع والمنابع والمنابع والمنابع والمنابع والمنابع والمنابع BARBADOS

At a residatio price. Departures are from Guidok on Saturdaya from 16th: April Inrough until 26th November, 14 nights at the Golden Palms Apartments in April and May costs from as little as \$265 pp (self cataring).

10 TRADISE

See your local travel agent for the Thomson Carlibbesh brochurs or ring your local Thomson diffice for datalla,

THOMSON HOLIDAYS

Prices do not include 2 per cent Government lavy
Only Government sotton can affect these prices. ATCL 152 BC